

DUAL FUEL ADD-ON HEAT PUMP GUIDE FOR OPERATIONAL COST SAVINGS

REGION 5

BARD MANUFACTURING COMPANY, BOX 607, BRYAN, OHIO 43506

(419) 636-1194

**MANUAL 2100-073 REV. B
SUPERSEDES REV. A**

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BRYAN, OHIO

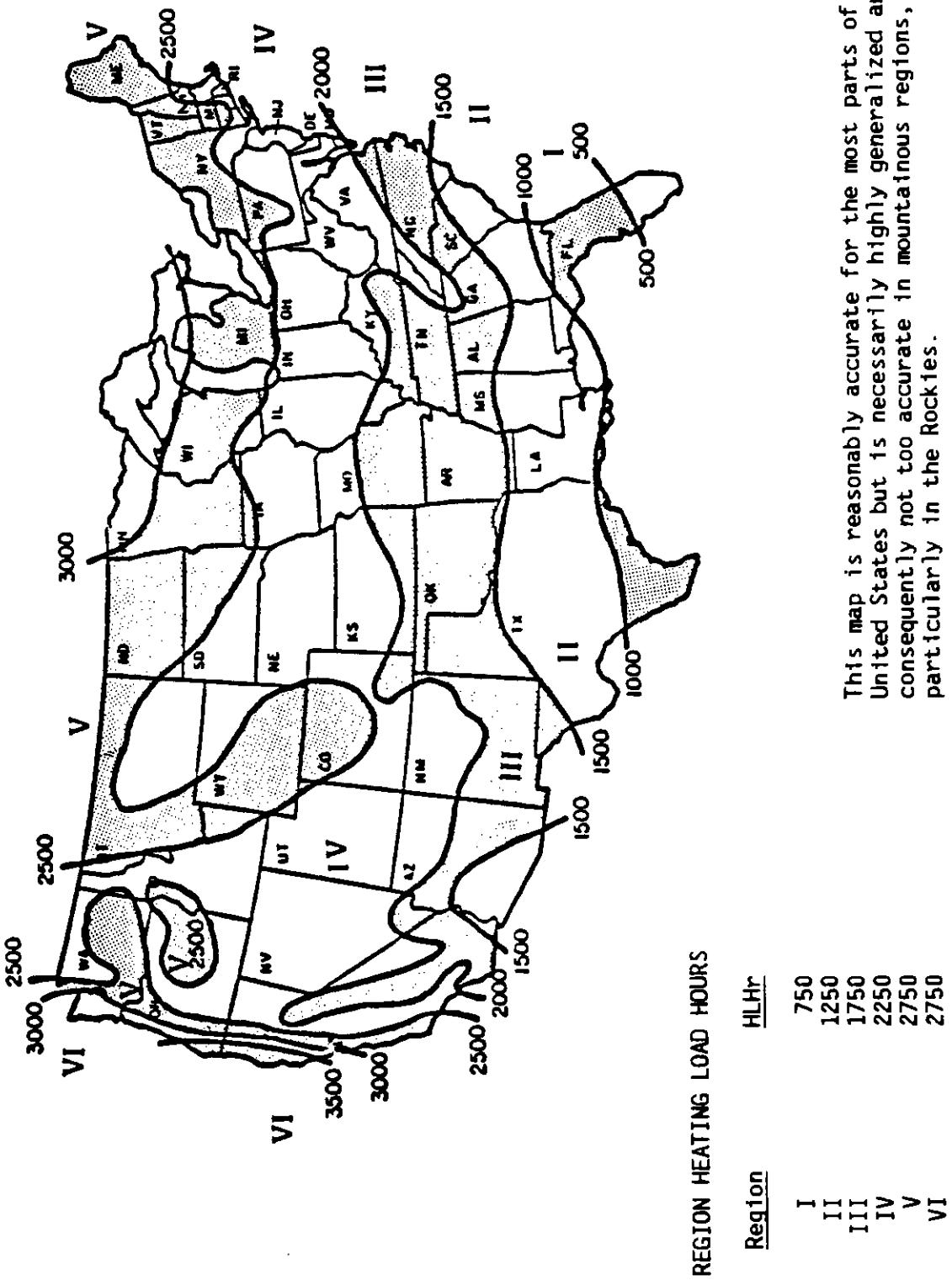


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| Heat Pump Outdoor Model | Heat Pump Indoor Model | Furnace Fuel | Furnace AFUE Efficiency Rating | Page |
|----------------------------|---------------------------|--------------|-----------------------------------|------|
| WQS30A | A36AQ-A | Electric | 100% | 1 |
| | | Natural Gas | 78% | 2 |
| | | Oil | 78% | 3 |
| | | Propane | 78% | 4 |
| WQS36A | A36AQ-A | Electric | 100% | 5 |
| | | Natural Gas | 78% | 6 |
| | | Oil | 78% | 7 |
| | | Propane | 78% | 8 |
| WQS42A | A42AQ-A | Electric | 100% | 9 |
| | | Natural Gas | 78% | 10 |
| | | Oil | 78% | 11 |
| | | Propane | 78% | 12 |
| 24UHPQA | A30AQ-A | Electric | 100% | 13 |
| | | Natural Gas | 78% | 14 |
| | | Oil | 78% | 15 |
| | | Propane | 78% | 16 |
| 24UHPQB | A36AQ-A | Electric | 100% | 17 |
| | | Natural Gas | 78% | 18 |
| | | Oil | 78% | 19 |
| | | Propane | 78% | 20 |
| 30UHPQA | A36AQ-A | Electric | 100% | 21 |
| | | Natural Gas | 78% | 22 |
| | | Oil | 78% | 23 |
| | | Propane | 78% | 24 |
| 30UHPQA | A37AQ-A | Electric | 100% | 25 |
| | | Natural Gas | 78% | 26 |
| | | Oil | 78% | 27 |
| | | Propane | 78% | 28 |
| 30UHPQA | A42AS-A | Electric | 100% | 29 |
| | | Natural Gas | 78% | 30 |
| | | Oil | 78% | 31 |
| | | Propane | 78% | 32 |
| 36UHPQA | A36AQ-A | Electric | 100% | 33 |
| | | Natural Gas | 78% | 34 |
| | | Oil | 78% | 35 |
| | | Propane | 78% | 36 |

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| Heat Pump Outdoor Model | Heat Pump Indoor Model | Furnace Fuel | Furnace AFUE Efficiency Rating | Page |
|------------------------------------|-----------------------------------|---|---|----------------------|
| 36UHPQA | A37AQ-A | Electric Natural Gas Oil Propane | 100% 78% 78% 78% | 37 38 39 40 |
| 36UHPQA | A42AS-A | Electric Natural Gas Oil Propane | 100% 78% 78% 78% | 41 42 43 44 |
| 42UHPQA | A61AQ-A | Electric Natural Gas Oil Propane | 100% 78% 78% 78% | 45 46 47 48 |
| 48UHPQA | A61AQ-A | Electric Natural Gas Oil Propane | 100% 78% 78% 78% | 49 50 51 52 |
| 60UHPQA | A61AQ-A | Electric Natural Gas Oil Propane | 100% 78% 78% 78% | 53 54 55 56 |

GENERAL DESCRIPTION

WHAT DOES THIS GUIDE SHOW?

This operational cost savings guide has been prepared to show theoretical cost savings for Bard dual fuel "add-on" heat pumps when used with either existing or new furnaces. It covers add-on applications for electric, oil, propane gas and natural gas type forced air furnaces. It includes both air source heat pumps and ground water source heat pumps at many combinations of gas, oil and electrical rates. It enables the user not only to make a theoretical operating cost comparison at today's fuel costs but also at future estimated higher energy costs.

It is important to understand that this is a theoretical comparison between fuels. Actual operation costs can vary depending on many difficult to predict variables such as the actual design heating or cooling load, air infiltration, and wind effects, solar effect, efficiency of existing furnace, severity of weather for a given heating or cooling season and also individual usage pattern.

SPECIAL FEATURE--FUEL SAVER MODULE

These estimates utilize the Bard Fuel Saver Module which permit the heat pump to operate below the balance point to maximize the energy savings. For each application an analysis should be made to determine the economic balance point which is the outdoor temperature at which it becomes more cost effective to shut the heat pump down with an outdoor thermostat. This temperature varies with each combination of fuel cost and furnace and heat pump efficiency level. Refer to tables included in the instructions with the Fuel Saver Module.

FURNACE EFFICIENCY

For purposes of these cost estimates, furnace efficiency levels of 100% AFUE for electric, 78% AFUE for natural and propane gas and 78% AFUE for oil was chosen. We recognize that any variation in efficiency from these values will change the operating cost somewhat. These values were chosen to best represent typical efficiency levels of most equipment in the field today.

HOW TO USE DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

1. Determine the heating Btuh loss and cooling Btuh gain for structure using a Bard "Whole-House Heat Loss and Gain Work Sheet," Form B008, ACCA "Load Calculation," Manual J.
 - a. Heating house Btuh loss is _____.
 - b. Cooling house Btuh gain is _____.
2. Determine the type of fuel available at structure (what type of {fuel} heating system is already there).
 - a. Electricity
 - b. Natural Gas
 - c. Propane Gas
 - d. Fuel Oil
 - e. Good water supply and disposal
3. Call local utilities and determine area energy costs.
 - a. Electricity _____ \$Kilowatt-hour
 - b. Natural Gas _____ \$/Therm
 - c. Propane Gas _____ \$/Gallon
 - d. Fuel Oil _____ \$/Gallon
4. Tentatively select an add-on heat pump system using Bard Manual 2100-057, "Heat Pump Sizing" as a guide, and a Bard equipment catalog.
 - a. Air to air heat pump

| | | |
|-------|-------------|-----------|
| Model | Indoor Coil | |
| Btuh | Heat | Btuh Cool |
 - b. Water to air

| | | |
|-------|-------------|-----------|
| Model | Indoor Coil | |
| Btuh | Heat | Btuh Cool |
5. Determine heating region where the structure is located. To do this, find the geographic location of house on regional heating load hours map. A map is located inside the front cover of this guide.
 - A. Region structure is located _____.
6. Select the "Dual Fuel Add-On Heat Pump Guide" for the region the structure is located. (See step 5 above.)

7. Locate the add-on heat pump model or models you tentatively selected (Step 4) in the "Guide." Refer to Table of Contents.

EXAMPLE: 36UHPQA w/A36AQ-A Indoor Coil

BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| REGION 5 | 36UHPQA/A36AQ-A |
|--|-----------------|
| HEAT PUMP MODEL: OUTDOOR 36UHPQA | INDOOR A36AQ-A |
| ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69 | |
| ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, EERPF 6.90 MIN.DRR REG IV | |
| BTUH (17) 20000, COP(17) 2.20 | |

8. Now locate the furnace type by fuel used (Step 2).

EXAMPLE: A fuel oil furnace with AFUE of 78%.

FURNACE TYPE FUEL OIL

FURNACE EFFICIENCY 78.00 % AFUE

9. You now have located the page or pages that will help you determine annual operating cost. See example--Figure 1.

A. Locate the closest structure loss in Btuh column on left side of page (step 1).

EXAMPLE: 70,000 Btuh Heat Loss

B. Locate the heating cost per unit at top of page (step 3).

EXAMPLE: \$1.40 per gallon fuel oil

C. Now read down the fuel cost column until directly across from the structure heat loss in Btuh. This will be the theoretical annual heating cost using only the furnace.

EXAMPLE: 70,000 Btuh heat loss @ \$1.40 per gallon fuel oil,
the annual cost will be \$1,912.

D. Next locate the electric cost \$/KW under Heat Loss Btuh for structure (step 3).

EXAMPLE: \$.06 KW rate

E. Now once again read down the fuel cost column until directly across from electric cost \$/KW. You now have located the annual heating cost for the house using an add-on heat pump with the furnace.

EXAMPLE: 70,000 Btuh structure heat loss, with \$.06 KW cost and \$1.40 per gallon fuel oil. The annual cost using a 36UHPQA Bard heat pump with the oil furnace would be \$1,613 for an annual savings of \$299 (\$1,912 minus \$1,613).

Now repeat steps 8 through 9 for each type fuel and/or heat pump selected. This will enable you to select the best combination of furnace and heat pump to use for a structure.

10. The balance point (the outdoor temperature at which the heat pump is running 100% of the time and just meeting structure heat loss requirements) is located on right side of page.

EXAMPLE: For a structure with a 70,000 Btuh with a 36UHPQA heat pump has a balance point of 31°F. Below this theoretical balance point, the heating load is automatically transferred between the heat pump and the furnace by the wall thermostat to maintain the desired temperature. This is accomplished with the Fuel Saver Module.

| | | |
|--------|---|--|
| 70,000 | \$ 952 1092 1231 1363 1502 1641 1780 1912 2052 2191 2323 2462 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 946 | 1029 1119 1203 1286 1377 1460 1544 1627 1718 1801 1885 |
| .06 | \$ 1015 | 1099 1189 1277 1356 1446 1530 1613 1697 1787 1871 1954 |
| .07 | \$ 1085 | 1168 1259 1342 1426 1516 1599 1683 1766 1857 1940 2024 |
| .08 | \$ 1154 | 1238 1328 1412 1495 1586 1669 1752 1836 1926 2010 2093 |
| .09 | \$ 1224 | 1307 1398 1481 1565 1655 1739 1822 1905 1996 2079 2163 |
| .10 | \$ 1293 | 1377 1461 1551 1634 1725 1808 1892 1975 2065 2149 2232 |
| .12 | \$ 1432 | 1516 1606 1690 1773 1864 1947 2031 2114 2205 2288 2372 |
| .14 | \$ 1572 | 1655 1745 1829 1912 2003 2086 2170 2253 2344 2427 2511 |
| .16 | \$ 1711 | 1794 1885 1968 2052 2142 2225 2309 2392 2483 2566 2650 |
| | | BALANCE POINT 31 DEG.F. - 10 |

11. To find annual cooling cost of heat pump, look at the bottom of page under annual air conditioning cost. Directly under the electric rate \$/KW (step 3) line, is located the annual cooling cost.

EXAMPLE: At .06 \$/KW rate for electricity, the cooling cost would be \$91.00 annually.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| s | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 | --ELECTRIC RATE \$/KWH | --THEORETICAL AIR CONDITIONING COST |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------------|-------------------------------------|
| | | | | | | | | | | | |

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

NOTE: The accuracy of the "Dual Fuel-Add-On Heat Pump Guide to Energy Cost Savings," is directly affected by how accurately you estimate the structure's heat loss and heat gain in step 1. Because of uncontrollable variables, Bard Manufacturing Company is not responsible for any variation in actual operating costs from these theoretical estimates.

FIGURE 1

| HEAT LOSS BTUH | KLEC COST S/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | | |
|----------------|-----------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|--|--|--|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | | | |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 500 | 521 | 542 | 563 | 584 | 605 | 626 | 646 | 667 | 688 | 709 | 737 | | | |
| | .06 | \$ 570 | 591 | 612 | 633 | 653 | 674 | 695 | 716 | 737 | 758 | 779 | 806 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 639 | 660 | 681 | 702 | 723 | 744 | 765 | 786 | 806 | 827 | 848 | 876 | | | |
| | .08 | \$ 716 | 737 | 758 | 779 | 799 | 820 | 841 | 862 | 883 | 904 | 925 | 952 | | | |
| | .09 | \$ 786 | 806 | 827 | 848 | 869 | 890 | 911 | 932 | 952 | 973 | 994 | 1022 | | | |
| | .10 | \$ 855 | 876 | 897 | 918 | 939 | 959 | 980 | 1001 | 1022 | 1043 | 1064 | 1092 | | | |
| | .12 | \$ 994 | 1015 | 1036 | 1057 | 1078 | 1099 | 1119 | 1140 | 1161 | 1182 | 1203 | 1231 | | | |
| | .14 | \$ 1140 | 1161 | 1182 | 1203 | 1224 | 1245 | 1266 | 1286 | 1307 | 1328 | 1349 | 1377 | BALANCE POINT 13 DEG.F. | | |
| | .16 | \$ 1279 | 1300 | 1321 | 1342 | 1363 | 1384 | 1405 | 1426 | 1446 | 1467 | 1488 | 1516 | | | |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 563 | 591 | 612 | 639 | 660 | 688 | 709 | 730 | 758 | 779 | 806 | 827 | | | |
| | .06 | \$ 646 | 674 | 695 | 723 | 744 | 772 | 793 | 813 | 841 | 862 | 890 | 911 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 723 | 751 | 772 | 799 | 820 | 848 | 869 | 890 | 918 | 939 | 966 | 987 | | | |
| | .08 | \$ 799 | 827 | 848 | 876 | 897 | 925 | 946 | 966 | 994 | 1015 | 1043 | 1064 | | | |
| | .09 | \$ 883 | 911 | 932 | 959 | 980 | 1008 | 1029 | 1050 | 1078 | 1099 | 1126 | 1147 | | | |
| | .10 | \$ 959 | 987 | 1008 | 1036 | 1057 | 1085 | 1106 | 1126 | 1154 | 1175 | 1203 | 1224 | | | |
| | .12 | \$ 1119 | 1147 | 1168 | 1196 | 1217 | 1245 | 1266 | 1286 | 1314 | 1335 | 1363 | 1384 | | | |
| | .14 | \$ 1279 | 1307 | 1328 | 1356 | 1377 | 1405 | 1426 | 1446 | 1474 | 1495 | 1523 | 1544 | BALANCE POINT 16 DEG.F. | | |
| | .16 | \$ 1439 | 1467 | 1488 | 1516 | 1537 | 1565 | 1586 | 1606 | 1634 | 1655 | 1683 | 1704 | | | |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 695 | 744 | 793 | 841 | 890 | 939 | 987 | 1036 | 1085 | 1133 | 1189 | 1238 | | | |
| | .06 | \$ 765 | 813 | 862 | 911 | 959 | 1008 | 1057 | 1106 | 1154 | 1203 | 1259 | 1307 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 834 | 883 | 932 | 980 | 1029 | 1078 | 1126 | 1175 | 1224 | 1272 | 1328 | 1377 | | | |
| | .08 | \$ 904 | 952 | 1001 | 1050 | 1099 | 1147 | 1196 | 1245 | 1293 | 1342 | 1398 | 1446 | | | |
| | .09 | \$ 966 | 1015 | 1064 | 1112 | 1161 | 1210 | 1259 | 1307 | 1356 | 1405 | 1460 | 1509 | | | |
| | .10 | \$ 1036 | 1085 | 1133 | 1182 | 1231 | 1279 | 1328 | 1377 | 1426 | 1474 | 1530 | 1579 | | | |
| | .12 | \$ 1175 | 1224 | 1272 | 1321 | 1370 | 1419 | 1467 | 1516 | 1565 | 1613 | 1669 | 1718 | | | |
| | .14 | \$ 1314 | 1363 | 1412 | 1460 | 1509 | 1558 | 1606 | 1655 | 1704 | 1752 | 1808 | 1857 | BALANCE POINT 22 DEG.F. | | |
| | .16 | \$ 1453 | 1502 | 1551 | 1599 | 1648 | 1697 | 1745 | 1794 | 1843 | 1892 | 1947 | 1996 | | | |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 820 | 890 | 966 | 1036 | 1112 | 1189 | 1259 | 1335 | 1405 | 1481 | 1551 | 1627 | | | |
| | .06 | \$ 883 | 952 | 1029 | 1099 | 1175 | 1252 | 1321 | 1398 | 1467 | 1544 | 1613 | 1690 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 946 | 1015 | 1092 | 1161 | 1238 | 1314 | 1384 | 1460 | 1530 | 1606 | 1676 | 1752 | | | |
| | .08 | \$ 1001 | 1071 | 1147 | 1217 | 1293 | 1370 | 1439 | 1516 | 1586 | 1662 | 1732 | 1808 | | | |
| | .09 | \$ 1064 | 1133 | 1210 | 1279 | 1356 | 1432 | 1502 | 1579 | 1648 | 1725 | 1794 | 1871 | | | |
| | .10 | \$ 1126 | 1196 | 1272 | 1342 | 1419 | 1495 | 1565 | 1641 | 1711 | 1787 | 1857 | 1933 | | | |
| | .12 | \$ 1252 | 1321 | 1398 | 1467 | 1544 | 1620 | 1690 | 1766 | 1836 | 1912 | 1982 | 2059 | | | |
| | .14 | \$ 1370 | 1439 | 1516 | 1586 | 1662 | 1739 | 1808 | 1885 | 1954 | 2031 | 2100 | 2177 | BALANCE POINT 27 DEG.F. | | |
| | .16 | \$ 1495 | 1565 | 1641 | 1711 | 1787 | 1864 | 1933 | 2010 | 2079 | 2156 | 2225 | 2302 | | | |
| 70,000 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| D | .05 | \$ 946 | 1029 | 1119 | 1203 | 1286 | 1377 | 1460 | 1544 | 1627 | 1718 | 1801 | 1885 | | | |
| | .06 | \$ 1015 | 1099 | 1189 | 1272 | 1356 | 1446 | 1530 | 1613 | 1697 | 1787 | 1871 | 1954 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 1085 | 1168 | 1259 | 1342 | 1426 | 1516 | 1599 | 1683 | 1766 | 1857 | 1940 | 2024 | | | |
| | .08 | \$ 1154 | 1238 | 1328 | 1412 | 1495 | 1586 | 1669 | 1752 | 1836 | 1926 | 2010 | 2093 | | | |
| | .09 | \$ 1224 | 1307 | 1398 | 1481 | 1565 | 1655 | 1739 | 1822 | 1905 | 1996 | 2079 | 2163 | | | |
| | .10 | \$ 1293 | 1377 | 1467 | 1551 | 1634 | 1725 | 1808 | 1892 | 1975 | 2065 | 2149 | 2232 | | | |
| | .12 | \$ 1432 | 1516 | 1606 | 1690 | 1773 | 1864 | 1947 | 2031 | 2114 | 2205 | 2288 | 2372 | | | |
| | .14 | \$ 1572 | 1655 | 1745 | 1829 | 1912 | 2003 | 2086 | 2170 | 2253 | 2344 | 2427 | 2511 | BALANCE POINT 31 DEG.F. | | |
| | .16 | \$ 1711 | 1794 | 1885 | 1968 | 2052 | 2142 | 2225 | 2309 | 2392 | 2483 | 2566 | 2650 | | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

 .05 .06 .07 .08 .09 .10 .12 .14 .16
 \$ 75 91 106 121 136 151 182 212 243

<--ELECTRIC RATE S/KWH
 <--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: COMPRESSOR SECTION MOS30A INDOOR A36AO-A
COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH 17.75 SEER
HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH 3.35 COP
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

| HEAT LOSS BTUH | ELRC. COST S/KWH |
|-------------------|------------------------|
|-------------------|------------------------|

25,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|-----|------|
| .05 | S | 306 | 772 |
| .06 | S | 368 | 925 |
| .07 | S | 438 | 1085 |
| .08 | S | 493 | 1238 |
| .09 | S | 556 | 1391 |
| .10 | S | 619 | 1544 |
| .12 | S | 744 | 1857 |
| .14 | S | 862 | 2170 |
| .16 | S | 994 | 2476 |

30,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 361 | 925 |
| .06 | S | 438 | 1112 |
| .07 | S | 507 | 1300 |
| .08 | S | 584 | 1488 |
| .09 | S | 653 | 1669 |
| .10 | S | 730 | 1857 |
| .12 | S | 876 | 2232 |
| .14 | S | 1022 | 2601 |
| .16 | S | 1168 | 2977 |

BALANCE POINT 15- DEG. F.

35,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 417 | 1085 |
| .06 | S | 500 | 1300 |
| .07 | S | 591 | 1516 |
| .08 | S | 667 | 1732 |
| .09 | S | 758 | 1947 |
| .10 | S | 841 | 2170 |
| .12 | S | 1008 | 2601 |
| .14 | S | 1182 | 3039 |
| .16 | S | 1349 | 3471 |

BALANCE POINT 3- DEG. F.

40,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 479 | 1238 |
| .06 | S | 577 | 1488 |
| .07 | S | 661 | 1732 |
| .08 | S | 765 | 1982 |
| .09 | S | 862 | 2232 |
| .10 | S | 959 | 2476 |
| .12 | S | 1147 | 2977 |
| .14 | S | 1342 | 3471 |
| .16 | S | 1530 | 3965 |

BALANCE POINT 5 DEG. F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 626 | 1544 |
| .06 | S | 751 | 1857 |
| .07 | S | 869 | 2170 |
| .08 | S | 994 | 2476 |
| .09 | S | 1119 | 2789 |
| .10 | S | 1245 | 3095 |
| .12 | S | 1455 | 3721 |
| .14 | S | 1739 | 4340 |
| .16 | S | 1996 | 4959 |

BALANCE POINT 17 DEG. F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | 35 | 42 | 50 | 57 | 64 | 71 | 85 | 100 | 114 |

<--ELECTRIC RATE S/KWH
<--THEORETICAL AIR CONDITIONING COST

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DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION WOS30A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH 17.25 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH 3.35 COP
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|--|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 |
| 25,000 | \$ 236 | 271 | 299 | 333 | 368 | 403 | 438 | 473 | 507 | 542 | 605 | 674 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 271 | 271 | 271 | 278 | 278 | 278 | 285 | 285 | 285 | 292 | 299 | 299 | |
| .06 | \$ 319 | 319 | 319 | 326 | 326 | 326 | 333 | 333 | 333 | 340 | 347 | 347 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 375 | 375 | 375 | 382 | 382 | 382 | 389 | 389 | 389 | 396 | 403 | 403 | |
| .08 | \$ 424 | 424 | 424 | 431 | 431 | 431 | 438 | 438 | 438 | 445 | 452 | 452 | |
| .09 | \$ 473 | 473 | 473 | 479 | 479 | 479 | 486 | 486 | 486 | 493 | 500 | 500 | |
| .10 | \$ 521 | 521 | 521 | 528 | 528 | 528 | 535 | 535 | 535 | 542 | 549 | 549 | |
| .12 | \$ 626 | 626 | 626 | 633 | 633 | 633 | 639 | 639 | 639 | 646 | 653 | 653 | |
| .14 | \$ 723 | 723 | 723 | 730 | 730 | 730 | 737 | 737 | 737 | 744 | 751 | 751 | |
| .16 | \$ 827 | 827 | 827 | 834 | 834 | 834 | 841 | 841 | 841 | 848 | 855 | 855 | |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 313 | 319 | 319 | 326 | 326 | 333 | 333 | 333 | 340 | 340 | 347 | 354 | |
| .06 | \$ 375 | 382 | 382 | 389 | 389 | 396 | 396 | 396 | 403 | 403 | 410 | 417 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 431 | 438 | 438 | 445 | 445 | 452 | 452 | 452 | 459 | 459 | 466 | 473 | |
| .08 | \$ 493 | 500 | 500 | 507 | 507 | 514 | 514 | 514 | 521 | 521 | 528 | 535 | |
| .09 | \$ 549 | 556 | 556 | 563 | 563 | 570 | 570 | 570 | 577 | 577 | 584 | 591 | |
| .10 | \$ 612 | 619 | 619 | 626 | 626 | 633 | 633 | 633 | 639 | 639 | 646 | 653 | |
| .12 | \$ 730 | 737 | 737 | 744 | 744 | 751 | 751 | 751 | 758 | 758 | 765 | 772 | |
| .14 | \$ 848 | 855 | 855 | 862 | 862 | 869 | 869 | 869 | 876 | 876 | 883 | 890 | BALANCE POINT 15- DEG.F. |
| .16 | \$ 959 | 966 | 966 | 973 | 973 | 980 | 980 | 980 | 987 | 987 | 994 | 1001 | |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 361 | 361 | 368 | 375 | 382 | 389 | 396 | 396 | 403 | 410 | 424 | 431 | |
| .06 | \$ 431 | 431 | 438 | 445 | 452 | 459 | 466 | 466 | 473 | 479 | 493 | 500 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 493 | 493 | 500 | 507 | 514 | 521 | 528 | 528 | 535 | 542 | 556 | 563 | |
| .08 | \$ 556 | 556 | 563 | 570 | 577 | 584 | 591 | 591 | 598 | 605 | 619 | 626 | |
| .09 | \$ 626 | 626 | 633 | 639 | 646 | 653 | 660 | 660 | 667 | 674 | 688 | 695 | |
| .10 | \$ 688 | 688 | 695 | 702 | 709 | 716 | 723 | 723 | 730 | 737 | 751 | 758 | |
| .12 | \$ 820 | 820 | 827 | 834 | 841 | 848 | 855 | 855 | 862 | 869 | 883 | 890 | |
| .14 | \$ 946 | 946 | 952 | 959 | 966 | 973 | 980 | 980 | 987 | 994 | 1008 | 1015 | |
| .16 | \$ 1078 | 1078 | 1085 | 1092 | 1099 | 1106 | 1112 | 1112 | 1119 | 1126 | 1140 | 1147 | BALANCE POINT 3- DEG.F. |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 403 | 410 | 417 | 431 | 438 | 445 | 452 | 459 | 466 | 479 | 493 | 507 | |
| .06 | \$ 473 | 479 | 486 | 500 | 507 | 514 | 521 | 528 | 535 | 549 | 563 | 577 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 549 | 556 | 563 | 577 | 584 | 591 | 598 | 605 | 612 | 626 | 639 | 653 | |
| .08 | \$ 619 | 626 | 633 | 646 | 653 | 660 | 667 | 674 | 681 | 695 | 709 | 723 | |
| .09 | \$ 688 | 695 | 702 | 716 | 723 | 730 | 737 | 744 | 751 | 765 | 779 | 793 | |
| .10 | \$ 758 | 765 | 772 | 786 | 793 | 799 | 806 | 813 | 820 | 834 | 848 | 862 | |
| .12 | \$ 897 | 904 | 911 | 925 | 932 | 939 | 946 | 952 | 959 | 973 | 987 | 1001 | |
| .14 | \$ 1036 | 1043 | 1050 | 1064 | 1071 | 1078 | 1085 | 1092 | 1099 | 1112 | 1126 | 1140 | |
| .16 | \$ 1175 | 1182 | 1189 | 1203 | 1210 | 1217 | 1224 | 1231 | 1238 | 1252 | 1266 | 1279 | BALANCE POINT 5 DEG.F. |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 493 | 521 | 549 | 577 | 605 | 626 | 653 | 681 | 709 | 737 | 793 | 841 | |
| .06 | \$ 556 | 584 | 612 | 639 | 667 | 688 | 716 | 744 | 772 | 799 | 855 | 904 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 619 | 646 | 674 | 702 | 730 | 751 | 779 | 806 | 834 | 862 | 918 | 966 | |
| .08 | \$ 681 | 709 | 737 | 765 | 793 | 813 | 841 | 869 | 897 | 925 | 980 | 1029 | |
| .09 | \$ 744 | 772 | 799 | 827 | 855 | 876 | 904 | 932 | 959 | 987 | 1043 | 1092 | |
| .10 | \$ 806 | 834 | 862 | 890 | 918 | 939 | 966 | 994 | 1022 | 1050 | 1106 | 1154 | |
| .12 | \$ 932 | 959 | 987 | 1015 | 1043 | 1064 | 1092 | 1119 | 1147 | 1175 | 1231 | 1279 | |
| .14 | \$ 1057 | 1085 | 1112 | 1140 | 1168 | 1189 | 1217 | 1245 | 1272 | 1300 | 1356 | 1405 | |
| .16 | \$ 1175 | 1203 | 1231 | 1259 | 1286 | 1307 | 1335 | 1363 | 1391 | 1419 | 1474 | 1523 | BALANCE POINT 17 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
 s 35 42 50 57 64 71 85 100 114

--ELECTRIC RATE \$/KWH
 --THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION WOS30A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH, 17.25 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH 3.35 COP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 |
| 25,000 | \$.340 | 389 | 438 | 486 | 535 | 584 | 633 | 681 | 730 | 779 | 827 | 876 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 278 | 278 | 285 | 285 | 292 | 292 | 299 | 299 | 306 | 306 | 313 | 313 |
| | .06 | \$ 326 | 326 | 333 | 333 | 340 | 340 | 347 | 347 | 354 | 354 | 361 | 361 |
| | .07 | \$ 382 | 382 | 389 | 389 | 396 | 396 | 403 | 403 | 410 | 410 | 417 | 417 |
| | .08 | \$ 431 | 431 | 438 | 438 | 445 | 445 | 452 | 452 | 459 | 459 | 466 | 466 |
| | .09 | \$ 479 | 479 | 486 | 486 | 493 | 493 | 500 | 500 | 507 | 507 | 514 | 514 |
| | .10 | \$ 528 | 528 | 535 | 535 | 542 | 542 | 549 | 549 | 556 | 556 | 563 | 563 |
| | .12 | \$ 633 | 633 | 639 | 639 | 646 | 646 | 653 | 653 | 660 | 660 | 667 | 667 |
| | .14 | \$ 730 | 730 | 737 | 737 | 744 | 744 | 751 | 751 | 758 | 758 | 765 | 765 |
| | .16 | \$ 834 | 834 | 841 | 841 | 848 | 848 | 855 | 855 | 862 | 862 | 869 | 869 |
| 30,000 | \$.410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 326 | 326 | 333 | 340 | 340 | 347 | 354 | 354 | 361 | 368 | 368 | 375 |
| | .06 | \$ 389 | 389 | 396 | 403 | 403 | 410 | 417 | 417 | 424 | 431 | 431 | 438 |
| | .07 | \$ 445 | 445 | 452 | 459 | 459 | 466 | 473 | 473 | 479 | 486 | 486 | 493 |
| | .08 | \$ 507 | 507 | 514 | 521 | 521 | 528 | 535 | 535 | 542 | 549 | 549 | 556 |
| | .09 | \$ 563 | 563 | 570 | 577 | 577 | 584 | 591 | 591 | 598 | 605 | 605 | 612 |
| | .10 | \$ 626 | 626 | 633 | 639 | 639 | 646 | 653 | 653 | 660 | 667 | 667 | 674 |
| | .12 | \$ 744 | 744 | 751 | 758 | 758 | 765 | 772 | 772 | 779 | 786 | 786 | 793 |
| | .14 | \$ 862 | 862 | 869 | 876 | 876 | 883 | 890 | 890 | 897 | 904 | 904 | 911 |
| | .16 | \$ 973 | 973 | 980 | 987 | 987 | 994 | 1001 | 1001 | 1008 | 1015 | 1015 | 1022 |
| 35,000 | \$.473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 375 | 382 | 389 | 403 | 410 | 417 | 424 | 431 | 438 | 452 | 459 | 466 |
| | .06 | \$ 445 | 452 | 459 | 473 | 479 | 486 | 493 | 500 | 507 | 521 | 528 | 535 |
| | .07 | \$ 507 | 514 | 521 | 535 | 542 | 549 | 556 | 563 | 570 | 584 | 591 | 598 |
| | .08 | \$ 570 | 577 | 584 | 598 | 605 | 612 | 619 | 626 | 633 | 646 | 653 | 660 |
| | .09 | \$ 639 | 646 | 653 | 667 | 674 | 681 | 688 | 695 | 702 | 716 | 723 | 730 |
| | .10 | \$ 702 | 709 | 716 | 730 | 737 | 744 | 751 | 758 | 765 | 779 | 786 | 793 |
| | .12 | \$ 834 | 841 | 848 | 862 | 869 | 876 | 883 | 890 | 897 | 911 | 918 | 925 |
| | .14 | \$ 959 | 966 | 973 | 987 | 994 | 1001 | 1008 | 1015 | 1022 | 1036 | 1043 | 1050 |
| | .16 | \$ 1092 | 1099 | 1106 | 1119 | 1126 | 1133 | 1140 | 1147 | 1154 | 1168 | 1175 | 1182 |
| 40,000 | \$.542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 431 | 438 | 452 | 466 | 473 | 486 | 500 | 514 | 521 | 535 | 549 | 556 |
| | .06 | \$ 500 | 507 | 521 | 535 | 542 | 556 | 570 | 584 | 591 | 605 | 619 | 626 |
| | .07 | \$ 577 | 584 | 598 | 612 | 619 | 633 | 646 | 660 | 667 | 681 | 695 | 702 |
| | .08 | \$ 646 | 653 | 667 | 681 | 688 | 702 | 716 | 730 | 737 | 751 | 765 | 772 |
| | .09 | \$ 716 | 723 | 737 | 751 | 758 | 772 | 786 | 799 | 806 | 820 | 834 | 841 |
| | .10 | \$ 786 | 793 | 806 | 820 | 827 | 841 | 855 | 869 | 876 | 890 | 904 | 911 |
| | .12 | \$ 925 | 932 | 946 | 959 | 966 | 980 | 994 | 1008 | 1015 | 1029 | 1043 | 1050 |
| | .14 | \$ 1064 | 1071 | 1085 | 1099 | 1106 | 1119 | 1133 | 1147 | 1154 | 1168 | 1182 | 1189 |
| | .16 | \$ 1203 | 1210 | 1224 | 1238 | 1245 | 1259 | 1272 | 1286 | 1293 | 1307 | 1321 | 1328 |
| 50,000 | \$.681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 577 | 619 | 653 | 695 | 730 | 772 | 813 | 848 | 890 | 925 | 966 | 1001 |
| | .06 | \$ 639 | 681 | 716 | 758 | 793 | 834 | 876 | 911 | 952 | 987 | 1029 | 1064 |
| | .07 | \$ 702 | 744 | 779 | 820 | 855 | 897 | 939 | 973 | 1015 | 1050 | 1092 | 1126 |
| | .08 | \$ 765 | 806 | 841 | 883 | 918 | 959 | 1001 | 1036 | 1078 | 1112 | 1154 | 1189 |
| | .09 | \$ 827 | 869 | 904 | 946 | 980 | 1022 | 1064 | 1099 | 1140 | 1175 | 1217 | 1252 |
| | .10 | \$ 890 | 932 | 966 | 1008 | 1043 | 1085 | 1126 | 1161 | 1203 | 1238 | 1279 | 1314 |
| | .12 | \$ 1015 | 1057 | 1092 | 1133 | 1168 | 1210 | 1252 | 1286 | 1328 | 1363 | 1405 | 1439 |
| | .14 | \$ 1140 | 1182 | 1217 | 1259 | 1293 | 1335 | 1377 | 1412 | 1453 | 1488 | 1530 | 1565 |
| | .16 | \$ 1259 | 1300 | 1335 | 1377 | 1412 | 1453 | 1495 | 1530 | 1572 | 1606 | 1648 | 1683 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION MOS30A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH 17.25 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH 3.35 COP
 FURNACE TYPE: PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
| 25,000 | \$ | 445 | 479 | 521 | 556 | 591 | 633 | 667 | 702 | 744 | 813 | 890 | 890 |
| | .05 | \$ | 285 | 285 | 292 | 292 | 292 | 299 | 306 | 306 | 313 | 319 | 319 |
| | .06 | \$ | 333 | 333 | 340 | 340 | 340 | 347 | 347 | 354 | 354 | 361 | 368 |
| | .07 | \$ | 389 | 389 | 396 | 396 | 396 | 403 | 403 | 410 | 410 | 417 | 424 |
| | .08 | \$ | 438 | 438 | 445 | 445 | 445 | 452 | 452 | 459 | 459 | 466 | 473 |
| | .09 | \$ | 486 | 486 | 493 | 493 | 493 | 500 | 500 | 507 | 507 | 514 | 521 |
| | .10 | \$ | 535 | 535 | 542 | 542 | 542 | 549 | 549 | 556 | 556 | 563 | 570 |
| | .12 | \$ | 639 | 639 | 646 | 646 | 646 | 653 | 653 | 660 | 660 | 671 | 674 |
| | .14 | \$ | 737 | 737 | 744 | 744 | 744 | 751 | 758 | 758 | 765 | 772 | 772 |
| | .16 | \$ | 841 | 841 | 848 | 848 | 848 | 855 | 855 | 862 | 862 | 869 | 876 |
| 30,000 | \$ | 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 |
| | .05 | \$ | 333 | 340 | 340 | 347 | 347 | 354 | 354 | 361 | 361 | 368 | 375 |
| | .06 | \$ | 396 | 403 | 403 | 410 | 410 | 417 | 417 | 424 | 424 | 431 | 438 |
| | .07 | \$ | 452 | 459 | 459 | 466 | 466 | 473 | 473 | 479 | 479 | 486 | 493 |
| | .08 | \$ | 514 | 521 | 521 | 528 | 528 | 535 | 535 | 542 | 542 | 549 | 556 |
| | .09 | \$ | 570 | 577 | 584 | 584 | 584 | 591 | 591 | 598 | 598 | 605 | 612 |
| | .10 | \$ | 633 | 639 | 639 | 646 | 646 | 653 | 653 | 660 | 660 | 667 | 674 |
| | .12 | \$ | 751 | 758 | 758 | 765 | 765 | 772 | 772 | 779 | 779 | 786 | 793 |
| | .14 | \$ | 869 | 876 | 876 | 883 | 883 | 890 | 890 | 897 | 897 | 904 | 911 |
| | .16 | \$ | 980 | 987 | 987 | 994 | 994 | 1001 | 1001 | 1008 | 1008 | 1015 | 1022 |
| 35,000 | \$ | 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 |
| | .05 | \$ | 396 | 403 | 403 | 410 | 417 | 424 | 431 | 438 | 445 | 459 | 466 |
| | .06 | \$ | 466 | 473 | 473 | 479 | 486 | 493 | 500 | 507 | 514 | 528 | 535 |
| | .07 | \$ | 528 | 535 | 535 | 542 | 549 | 556 | 563 | 570 | 577 | 591 | 598 |
| | .08 | \$ | 591 | 598 | 598 | 605 | 612 | 619 | 626 | 633 | 639 | 653 | 660 |
| | .09 | \$ | 660 | 667 | 667 | 674 | 681 | 688 | 695 | 702 | 709 | 723 | 730 |
| | .10 | \$ | 723 | 730 | 730 | 737 | 744 | 751 | 758 | 765 | 772 | 786 | 793 |
| | .12 | \$ | 855 | 862 | 862 | 869 | 876 | 883 | 890 | 897 | 904 | 918 | 925 |
| | .14 | \$ | 980 | 987 | 987 | 994 | 1001 | 1008 | 1015 | 1022 | 1029 | 1043 | 1050 |
| | .16 | \$ | 1112 | 1119 | 1119 | 1126 | 1133 | 1140 | 1147 | 1154 | 1161 | 1175 | 1182 |
| 40,000 | \$ | 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 |
| | .05 | \$ | 452 | 466 | 473 | 479 | 486 | 500 | 507 | 514 | 528 | 542 | 563 |
| | .06 | \$ | 521 | 535 | 542 | 549 | 556 | 570 | 577 | 584 | 598 | 612 | 633 |
| | .07 | \$ | 598 | 612 | 619 | 626 | 633 | 646 | 653 | 660 | 674 | 688 | 709 |
| | .08 | \$ | 667 | 681 | 688 | 695 | 702 | 716 | 723 | 730 | 744 | 758 | 779 |
| | .09 | \$ | 731 | 751 | 758 | 765 | 772 | 786 | 793 | 799 | 813 | 827 | 848 |
| | .10 | \$ | 806 | 820 | 827 | 834 | 841 | 855 | 862 | 869 | 883 | 897 | 918 |
| | .12 | \$ | 946 | 959 | 966 | 973 | 980 | 994 | 1001 | 1008 | 1022 | 1036 | 1057 |
| | .14 | \$ | 1085 | 1099 | 1106 | 1112 | 1119 | 1133 | 1140 | 1147 | 1161 | 1175 | 1196 |
| | .16 | \$ | 1224 | 1238 | 1245 | 1252 | 1259 | 1272 | 1279 | 1286 | 1300 | 1314 | 1335 |
| 50,000 | \$ | 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 |
| | .05 | \$ | 660 | 688 | 723 | 751 | 779 | 806 | 841 | 869 | 897 | 959 | 1015 |
| | .06 | \$ | 723 | 751 | 786 | 813 | 841 | 869 | 904 | 932 | 959 | 1022 | 1078 |
| | .07 | \$ | 786 | 813 | 848 | 876 | 904 | 932 | 966 | 994 | 1022 | 1085 | 1140 |
| | .08 | \$ | 848 | 876 | 911 | 939 | 966 | 994 | 1029 | 1057 | 1085 | 1147 | 1203 |
| | .09 | \$ | 911 | 939 | 973 | 1001 | 1029 | 1057 | 1092 | 1119 | 1147 | 1210 | 1266 |
| | .10 | \$ | 973 | 1001 | 1036 | 1064 | 1092 | 1119 | 1154 | 1182 | 1210 | 1272 | 1328 |
| | .12 | \$ | 1099 | 1126 | 1161 | 1189 | 1217 | 1245 | 1279 | 1307 | 1335 | 1398 | 1453 |
| | .14 | \$ | 1224 | 1252 | 1286 | 1314 | 1342 | 1370 | 1405 | 1432 | 1460 | 1523 | 1579 |
| | .16 | \$ | 1342 | 1370 | 1405 | 1432 | 1460 | 1488 | 1523 | 1551 | 1579 | 1641 | 1697 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|--------|--------|--|--|--|--|
| \$.05 | \$.06 | \$.07 | \$.08 | \$.09 | \$.10 | \$.12 | \$.14 | \$.16 | | | | |
| \$ 35 | \$ 42 | \$ 50 | \$ 57 | \$ 64 | \$ 71 | \$ 85 | \$ 100 | \$ 114 | | | | |

<--ELECTRIC RATE \$/KWH

<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: COMPRESSOR SECTION MOS36A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 36950 BTUH, 16.70 SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 32300 BTUH, 3.50 COP
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS BTUH \$/KWH

35,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 417 | 1085 |
| .06 | \$ | 500 | 1300 |
| .07 | \$ | 577 | 1516 |
| .08 | \$ | 667 | 1732 |
| .09 | \$ | 751 | 1947 |
| .10 | \$ | 827 | 2170 |
| .12 | \$ | 1001 | 2601 |
| .14 | \$ | 1168 | 3039 |
| .16 | \$ | 1328 | 3471 |

40,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 466 | 1238 |
| .06 | \$ | 563 | 1488 |
| .07 | \$ | 660 | 1732 |
| .08 | \$ | 751 | 1982 |
| .09 | \$ | 841 | 2232 |
| .10 | \$ | 939 | 2476 |
| .12 | \$ | 1126 | 2977 |
| .14 | \$ | 1307 | 3471 |
| .16 | \$ | 1502 | 3965 |

BALANCE POINT 13- DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 577 | 1544 |
| .06 | \$ | 695 | 1857 |
| .07 | \$ | 806 | 2170 |
| .08 | \$ | 925 | 2476 |
| .09 | \$ | 1043 | 2789 |
| .10 | \$ | 1154 | 3095 |
| .12 | \$ | 1384 | 3721 |
| .14 | \$ | 1620 | 4340 |
| .16 | \$ | 1850 | 4959 |

BALANCE POINT 2 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 709 | 1857 |
| .06 | \$ | 848 | 2232 |
| .07 | \$ | 987 | 2601 |
| .08 | \$ | 1126 | 2977 |
| .09 | \$ | 1272 | 3345 |
| .10 | \$ | 1412 | 3721 |
| .12 | \$ | 1697 | 4465 |
| .14 | \$ | 1982 | 5210 |
| .16 | \$ | 2260 | 5954 |

BALANCE POINT 12 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 869 | 2170 |
| .06 | \$ | 1036 | 2601 |
| .07 | \$ | 1217 | 3039 |
| .08 | \$ | 1391 | 3471 |
| .09 | \$ | 1565 | 3902 |
| .10 | \$ | 1739 | 4340 |
| .12 | \$ | 2086 | 5210 |
| .14 | \$ | 2434 | 6079 |
| .16 | \$ | 2782 | 6942 |

BALANCE POINT 20 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

S .05 .06 .07 .08 .09 .10 .12 .14 .16
 \$.44 .53 .61 .70 .79 .88 .106 .123 .141

<--ELECTRIC RATE \$/KWH
 <--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION MOS36A INDOOR A36A0-A
 COOLING CAPACITY AT 45 DEG F. ENTERING WATER TEMP.: 36950 BTUH 16.70 SEER
 HEATING CAPACITY AT 45 DEG F. ENTERING WATER TEMP.: 32300 BTUH 3.50 COP
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 |
| | .05 | \$ 313 | 313 | 319 | 319 | 326 | 326 | 333 | 333 | 340 | 340 | 347 |
| | .06 | \$ 368 | 368 | 375 | 375 | 382 | 382 | 389 | 389 | 396 | 396 | 403 |
| | .07 | \$ 431 | 431 | 438 | 438 | 445 | 445 | 452 | 452 | 459 | 459 | 466 |
| | .08 | \$ 486 | 486 | 493 | 493 | 500 | 500 | 507 | 507 | 514 | 514 | 521 |
| | .09 | \$ 549 | 549 | 556 | 556 | 563 | 563 | 570 | 570 | 577 | 577 | 584 |
| | .10 | \$ 605 | 605 | 612 | 612 | 619 | 619 | 626 | 626 | 633 | 633 | 646 |
| | .12 | \$ 723 | 723 | 730 | 730 | 737 | 737 | 744 | 744 | 751 | 751 | 765 |
| | .14 | \$ 841 | 841 | 848 | 848 | 855 | 855 | 862 | 862 | 869 | 869 | 883 |
| | .16 | \$ 952 | 952 | 959 | 959 | 966 | 966 | 973 | 973 | 980 | 980 | 994 |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 |
| | .05 | \$ 361 | 361 | 368 | 368 | 375 | 375 | 382 | 382 | 389 | 389 | 396 |
| | .06 | \$ 431 | 431 | 438 | 438 | 445 | 445 | 452 | 452 | 459 | 459 | 466 |
| | .07 | \$ 493 | 493 | 500 | 500 | 507 | 507 | 514 | 514 | 521 | 521 | 528 |
| | .08 | \$ 563 | 563 | 570 | 570 | 577 | 577 | 584 | 584 | 591 | 591 | 598 |
| | .09 | \$ 633 | 633 | 639 | 639 | 646 | 646 | 653 | 653 | 660 | 660 | 667 |
| | .10 | \$ 695 | 695 | 702 | 702 | 709 | 709 | 716 | 716 | 723 | 723 | 730 |
| | .12 | \$ 834 | 834 | 841 | 841 | 848 | 848 | 855 | 855 | 862 | 862 | 876 |
| | .14 | \$ 966 | 966 | 973 | 973 | 980 | 980 | 987 | 987 | 994 | 994 | 1001 |
| | .16 | \$ 1099 | 1099 | 1106 | 1106 | 1112 | 1112 | 1119 | 1119 | 1126 | 1126 | 1133 |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 |
| | .05 | \$ 410 | 410 | 417 | 424 | 424 | 431 | 438 | 438 | 445 | 452 | 459 |
| | .06 | \$ 472 | 472 | 486 | 493 | 493 | 500 | 507 | 507 | 514 | 521 | 528 |
| | .07 | \$ 556 | 556 | 563 | 570 | 577 | 584 | 584 | 584 | 591 | 598 | 605 |
| | .08 | \$ 633 | 633 | 639 | 646 | 646 | 653 | 660 | 660 | 667 | 674 | 681 |
| | .09 | \$ 702 | 702 | 709 | 716 | 723 | 730 | 730 | 737 | 744 | 751 | 758 |
| | .10 | \$ 779 | 779 | 786 | 793 | 793 | 799 | 806 | 806 | 813 | 820 | 827 |
| | .12 | \$ 925 | 925 | 932 | 939 | 939 | 946 | 952 | 952 | 959 | 966 | 973 |
| | .14 | \$ 1078 | 1078 | 1085 | 1092 | 1092 | 1099 | 1106 | 1106 | 1112 | 1119 | 1126 |
| | .16 | \$ 1224 | 1224 | 1231 | 1238 | 1238 | 1245 | 1252 | 1252 | 1266 | 1272 | 1279 |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 |
| | .05 | \$ 493 | 507 | 514 | 528 | 535 | 542 | 556 | 563 | 577 | 584 | 605 |
| | .06 | \$ 577 | 591 | 598 | 612 | 619 | 626 | 639 | 646 | 660 | 667 | 688 |
| | .07 | \$ 660 | 674 | 681 | 695 | 702 | 709 | 723 | 730 | 744 | 751 | 772 |
| | .08 | \$ 744 | 758 | 765 | 779 | 786 | 793 | 806 | 813 | 827 | 834 | 855 |
| | .09 | \$ 827 | 841 | 848 | 862 | 869 | 876 | 890 | 897 | 911 | 918 | 939 |
| | .10 | \$ 911 | 925 | 932 | 946 | 952 | 959 | 973 | 980 | 994 | 1001 | 1022 |
| | .12 | \$ 1085 | 1099 | 1106 | 1119 | 1126 | 1133 | 1147 | 1154 | 1168 | 1175 | 1196 |
| | .14 | \$ 1252 | 1266 | 1272 | 1286 | 1293 | 1300 | 1314 | 1321 | 1335 | 1342 | 1363 |
| | .16 | \$ 1419 | 1432 | 1439 | 1453 | 1460 | 1467 | 1481 | 1488 | 1502 | 1509 | 1530 |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 |
| | .05 | \$ 584 | 612 | 633 | 660 | 688 | 709 | 737 | 758 | 786 | 813 | 862 |
| | .06 | \$ 660 | 688 | 709 | 737 | 765 | 786 | 813 | 834 | 862 | 890 | 939 |
| | .07 | \$ 744 | 772 | 793 | 820 | 848 | 869 | 897 | 918 | 946 | 973 | 1022 |
| | .08 | \$ 827 | 855 | 876 | 904 | 932 | 952 | 980 | 1001 | 1029 | 1057 | 1105 |
| | .09 | \$ 911 | 939 | 959 | 987 | 1015 | 1036 | 1064 | 1085 | 1112 | 1140 | 1189 |
| | .10 | \$ 987 | 1015 | 1036 | 1064 | 1092 | 1112 | 1140 | 1161 | 1189 | 1217 | 1266 |
| | .12 | \$ 1154 | 1182 | 1203 | 1231 | 1259 | 1279 | 1307 | 1328 | 1356 | 1384 | 1432 |
| | .14 | \$ 1314 | 1342 | 1363 | 1391 | 1419 | 1439 | 1467 | 1488 | 1516 | 1544 | 1592 |
| | .16 | \$ 1481 | 1509 | 1530 | 1558 | 1586 | 1606 | 1634 | 1655 | 1683 | 1711 | 1759 |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 |
| | .05 | \$ 674 | 709 | 751 | 786 | 827 | 862 | 897 | 939 | 973 | 1015 | 1092 |
| | .06 | \$ 758 | 793 | 834 | 869 | 911 | 946 | 980 | 1022 | 1057 | 1099 | 1175 |
| | .07 | \$ 834 | 869 | 911 | 946 | 987 | 1022 | 1057 | 1095 | 1133 | 1175 | 1245 |
| | .08 | \$ 918 | 952 | 994 | 1029 | 1071 | 1106 | 1140 | 1182 | 1217 | 1259 | 1335 |
| | .09 | \$ 1001 | 1036 | 1078 | 1112 | 1154 | 1189 | 1224 | 1266 | 1300 | 1342 | 1419 |
| | .10 | \$ 1085 | 1119 | 1161 | 1196 | 1238 | 1272 | 1307 | 1349 | 1384 | 1426 | 1502 |
| | .12 | \$ 1245 | 1279 | 1321 | 1356 | 1398 | 1432 | 1467 | 1509 | 1544 | 1586 | 1662 |
| | .14 | \$ 1412 | 1446 | 1488 | 1523 | 1565 | 1599 | 1634 | 1676 | 1711 | 1752 | 1829 |
| | .16 | \$ 1572 | 1606 | 1648 | 1683 | 1725 | 1759 | 1794 | 1836 | 1871 | 1912 | 1989 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16
 \$ 44 53 61 70 79 88 106 123 141

<-ELECTRIC RATE \$/KWH
 <-THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

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DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION WOS36A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 36950 BTUH 16.7U SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 32300 BTUH 3.50 COP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|--|--|--|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | | |
| 30,000 | \$ 410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 319 | 326 | 333 | 333 | 340 | 347 | 347 | 354 | 354 | 361 | 368 | 368 | | | |
| .06 | \$ 375 | 382 | 389 | 389 | 396 | 403 | 403 | 410 | 410 | 417 | 424 | 424 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .07 | \$ 438 | 445 | 452 | 452 | 459 | 466 | 466 | 473 | 473 | 479 | 486 | 486 | | | |
| .08 | \$ 493 | 500 | 507 | 507 | 514 | 521 | 521 | 528 | 528 | 535 | 542 | 542 | | | |
| .09 | \$ 556 | 563 | 570 | 570 | 577 | 584 | 584 | 591 | 591 | 598 | 605 | 605 | | | |
| .10 | \$ 612 | 619 | 626 | 626 | 633 | 639 | 639 | 646 | 646 | 653 | 660 | 660 | | | |
| .12 | \$ 730 | 737 | 744 | 744 | 751 | 758 | 758 | 765 | 765 | 772 | 779 | 779 | | | |
| .14 | \$ 848 | 855 | 862 | 862 | 869 | 876 | 876 | 883 | 883 | 890 | 897 | 897 | | | |
| .16 | \$ 959 | 966 | 973 | 973 | 980 | 987 | 987 | 994 | 994 | 1001 | 1008 | 1008 | | | |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 368 | 375 | 382 | 382 | 389 | 396 | 403 | 403 | 410 | 417 | 417 | 424 | | | |
| .06 | \$ 438 | 445 | 452 | 452 | 459 | 466 | 473 | 473 | 479 | 486 | 486 | 493 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .07 | \$ 500 | 507 | 514 | 514 | 521 | 528 | 535 | 535 | 542 | 549 | 549 | 556 | | | |
| .08 | \$ 570 | 577 | 584 | 584 | 591 | 598 | 605 | 605 | 612 | 619 | 619 | 626 | | | |
| .09 | \$ 639 | 646 | 653 | 653 | 660 | 667 | 674 | 674 | 681 | 688 | 688 | 695 | | | |
| .10 | \$ 702 | 709 | 716 | 716 | 723 | 730 | 737 | 737 | 744 | 751 | 751 | 758 | | | |
| .12 | \$ 841 | 848 | 855 | 855 | 862 | 869 | 876 | 876 | 883 | 890 | 890 | 897 | | | |
| .14 | \$ 973 | 980 | 987 | 987 | 994 | 1001 | 1008 | 1008 | 1015 | 1022 | 1022 | 1029 | BALANCE POINT 63 DEG.F. | | |
| .16 | \$ 1106 | 1112 | 1119 | 1119 | 1126 | 1133 | 1140 | 1140 | 1147 | 1154 | 1154 | 1161 | | | |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 424 | 431 | 438 | 445 | 452 | 459 | 466 | 466 | 473 | 479 | 486 | 493 | | | |
| .06 | \$ 493 | 500 | 507 | 514 | 521 | 528 | 535 | 535 | 542 | 549 | 556 | 563 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .07 | \$ 570 | 577 | 584 | 591 | 598 | 605 | 612 | 612 | 619 | 626 | 633 | 639 | | | |
| .08 | \$ 646 | 653 | 660 | 667 | 674 | 681 | 688 | 688 | 695 | 702 | 709 | 716 | | | |
| .09 | \$ 716 | 723 | 730 | 737 | 744 | 751 | 758 | 758 | 765 | 772 | 779 | 786 | | | |
| .10 | \$ 793 | 799 | 806 | 813 | 820 | 827 | 834 | 834 | 841 | 848 | 855 | 862 | | | |
| .12 | \$ 939 | 946 | 952 | 959 | 966 | 973 | 980 | 980 | 987 | 994 | 1001 | 1008 | | | |
| .14 | \$ 1092 | 1099 | 1106 | 1112 | 1119 | 1126 | 1133 | 1133 | 1140 | 1147 | 1154 | 1161 | BALANCE POINT 13- DEG.F. | | |
| .16 | \$ 1238 | 1245 | 1252 | 1259 | 1266 | 1272 | 1279 | 1279 | 1286 | 1293 | 1300 | 1307 | | | |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 528 | 542 | 556 | 570 | 584 | 598 | 612 | 626 | 639 | 660 | 674 | 688 | | | |
| .06 | \$ 612 | 626 | 639 | 653 | 667 | 681 | 695 | 709 | 723 | 744 | 758 | 772 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .07 | \$ 695 | 709 | 723 | 737 | 751 | 765 | 779 | 793 | 806 | 827 | 841 | 855 | | | |
| .08 | \$ 779 | 793 | 806 | 820 | 834 | 848 | 862 | 876 | 890 | 911 | 925 | 939 | | | |
| .09 | \$ 862 | 876 | 890 | 904 | 918 | 932 | 946 | 953 | 973 | 994 | 1008 | 1022 | | | |
| .10 | \$ 946 | 959 | 973 | 987 | 1001 | 1015 | 1029 | 1043 | 1057 | 1078 | 1092 | 1106 | | | |
| .12 | \$ 1119 | 1133 | 1147 | 1161 | 1175 | 1189 | 1203 | 1217 | 1231 | 1252 | 1266 | 1279 | BALANCE POINT 2 DEG.F. | | |
| .14 | \$ 1286 | 1300 | 1314 | 1328 | 1342 | 1356 | 1370 | 1384 | 1398 | 1419 | 1432 | 1446 | | | |
| .16 | \$ 1453 | 1467 | 1481 | 1495 | 1509 | 1523 | 1537 | 1551 | 1565 | 1586 | 1599 | 1613 | | | |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 660 | 702 | 737 | 772 | 806 | 841 | 883 | 918 | 952 | 987 | 1022 | 1057 | | | |
| .06 | \$ 737 | 779 | 813 | 848 | 883 | 918 | 959 | 994 | 1029 | 1064 | 1099 | 1133 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .07 | \$ 820 | 862 | 897 | 932 | 966 | 1001 | 1043 | 1078 | 1112 | 1147 | 1182 | 1217 | | | |
| .08 | \$ 904 | 946 | 980 | 1015 | 1050 | 1085 | 1126 | 1161 | 1196 | 1231 | 1266 | 1300 | | | |
| .09 | \$ 987 | 1029 | 1064 | 1099 | 1133 | 1168 | 1210 | 1245 | 1279 | 1314 | 1349 | 1384 | | | |
| .10 | \$ 1064 | 1106 | 1140 | 1175 | 1210 | 1245 | 1286 | 1321 | 1356 | 1391 | 1426 | 1460 | | | |
| .12 | \$ 1231 | 1272 | 1307 | 1342 | 1377 | 1412 | 1453 | 1488 | 1523 | 1558 | 1592 | 1627 | | | |
| .14 | \$ 1391 | 1432 | 1467 | 1502 | 1537 | 1572 | 1613 | 1648 | 1683 | 1718 | 1752 | 1787 | | | |
| .16 | \$ 1558 | 1599 | 1634 | 1669 | 1704 | 1739 | 1780 | 1815 | 1850 | 1885 | 1919 | 1954 | BALANCE POINT 12 DEG.F. | | |
| 70,000 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 793 | 841 | 897 | 952 | 1008 | 1064 | 1119 | 1168 | 1224 | 1279 | 1335 | 1391 | | | |
| .06 | \$ 876 | 925 | 980 | 1036 | 1092 | 1147 | 1203 | 1252 | 1307 | 1363 | 1419 | 1474 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .07 | \$ 952 | 1001 | 1057 | 1112 | 1168 | 1224 | 1279 | 1328 | 1384 | 1439 | 1495 | 1551 | | | |
| .08 | \$ 1036 | 1085 | 1140 | 1196 | 1252 | 1307 | 1363 | 1412 | 1467 | 1523 | 1579 | 1634 | | | |
| .09 | \$ 1119 | 1168 | 1224 | 1279 | 1335 | 1391 | 1446 | 1495 | 1551 | 1606 | 1662 | 1718 | | | |
| .10 | \$ 1203 | 1252 | 1307 | 1363 | 1419 | 1474 | 1530 | 1579 | 1634 | 1690 | 1745 | 1801 | | | |
| .12 | \$ 1363 | 1412 | 1467 | 1523 | 1579 | 1634 | 1690 | 1739 | 1794 | 1850 | 1905 | 1961 | | | |
| .14 | \$ 1530 | 1579 | 1634 | 1690 | 1745 | 1801 | 1857 | 1905 | 1961 | 2017 | 2072 | 2128 | BALANCE POINT 20 DEG.F. | | |
| .16 | \$ 1690 | 1739 | 1794 | 1850 | 1905 | 1961 | 2017 | 2065 | 2121 | 2177 | 2232 | 2288 | | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | |
|--|-------------------------------------|
| .05 .06 .07 .08 .09 .10 .12 .14 .16 | --ELECTRIC RATE \$/KWH |
| s .44 .53 .61 .70 .79 .88 .106 .123 .141 | --THEORETICAL AIR CONDITIONING COST |

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 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 32300 BTUH, 3.50 COP
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 76.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | | |
|----------------|-------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|---|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | | | |
| 30,000 | \$ 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 333 | 333 | 340 | 340 | 347 | 347 | 354 | 354 | 361 | 368 | 375 | 375 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 389 | 389 | 396 | 396 | 403 | 403 | 410 | 410 | 417 | 424 | 431 | 431 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .07 | \$ 452 | 452 | 459 | 459 | 466 | 466 | 473 | 473 | 479 | 486 | 493 | 493 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .08 | \$ 507 | 507 | 514 | 514 | 521 | 521 | 528 | 528 | 535 | 542 | 549 | 549 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .09 | \$ 570 | 570 | 577 | 577 | 584 | 584 | 591 | 591 | 598 | 605 | 612 | 612 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .10 | \$ 626 | 626 | 633 | 633 | 639 | 639 | 646 | 646 | 653 | 660 | 667 | 667 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .11 | \$ 744 | 744 | 751 | 751 | 758 | 758 | 765 | 765 | 772 | 779 | 786 | 786 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .12 | \$ 862 | 862 | 869 | 869 | 876 | 876 | 883 | 883 | 890 | 897 | 904 | 904 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .16 | \$ 973 | 973 | 980 | 980 | 987 | 987 | 994 | 994 | 1001 | 1008 | 1015 | 1015 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 382 | 382 | 389 | 389 | 396 | 403 | 403 | 410 | 410 | 417 | 424 | 424 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 452 | 452 | 459 | 459 | 466 | 473 | 473 | 479 | 479 | 486 | 493 | 493 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .07 | \$ 514 | 514 | 521 | 521 | 528 | 535 | 535 | 542 | 542 | 549 | 556 | 556 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .08 | \$ 584 | 584 | 591 | 591 | 598 | 605 | 605 | 612 | 612 | 619 | 626 | 626 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .09 | \$ 653 | 653 | 660 | 660 | 667 | 674 | 674 | 681 | 681 | 688 | 695 | 695 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .10 | \$ 716 | 716 | 723 | 723 | 730 | 737 | 737 | 744 | 744 | 751 | 758 | 758 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .12 | \$ 855 | 855 | 862 | 862 | 869 | 876 | 876 | 883 | 883 | 890 | 897 | 897 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .14 | \$ 987 | 987 | 994 | 994 | 1001 | 1008 | 1008 | 1015 | 1015 | 1022 | 1029 | 1029 | BALANCE POINT 63 DEG.F. |
| | .16 | \$ 1119 | 1119 | 1126 | 1126 | 1133 | 1140 | 1140 | 1147 | 1147 | 1154 | 1161 | 1161 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 438 | 445 | 445 | 452 | 459 | 459 | 466 | 473 | 479 | 486 | 500 | 500 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 507 | 514 | 514 | 521 | 528 | 528 | 535 | 542 | 549 | 556 | 570 | 570 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .07 | \$ 584 | 591 | 591 | 598 | 605 | 605 | 612 | 619 | 626 | 633 | 646 | 646 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .08 | \$ 660 | 667 | 667 | 674 | 681 | 681 | 688 | 695 | 702 | 709 | 723 | 723 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .09 | \$ 730 | 737 | 737 | 744 | 751 | 751 | 758 | 765 | 772 | 779 | 793 | 793 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .10 | \$ 806 | 813 | 813 | 820 | 827 | 827 | 834 | 841 | 848 | 855 | 869 | 869 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .12 | \$ 952 | 959 | 959 | 966 | 973 | 973 | 980 | 987 | 994 | 1001 | 1015 | 1015 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .14 | \$ 1106 | 1112 | 1112 | 1119 | 1126 | 1126 | 1133 | 1140 | 1147 | 1154 | 1168 | 1168 | BALANCE POINT 13- DEG.F. |
| | .16 | \$ 1252 | 1259 | 1259 | 1266 | 1272 | 1272 | 1279 | 1286 | 1293 | 1300 | 1314 | 1314 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 556 | 570 | 577 | 591 | 605 | 612 | 626 | 633 | 646 | 667 | 688 | 688 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 639 | 653 | 660 | 674 | 688 | 695 | 709 | 716 | 730 | 751 | 772 | 772 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .07 | \$ 723 | 737 | 744 | 758 | 772 | 779 | 793 | 799 | 813 | 834 | 855 | 855 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .08 | \$ 806 | 820 | 827 | 841 | 855 | 862 | 876 | 883 | 897 | 918 | 939 | 939 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .09 | \$ 890 | 904 | 911 | 925 | 939 | 946 | 959 | 966 | 980 | 1001 | 1022 | 1022 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .10 | \$ 973 | 987 | 994 | 1008 | 1022 | 1029 | 1043 | 1050 | 1064 | 1085 | 1106 | 1106 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .12 | \$ 1147 | 1161 | 1168 | 1182 | 1196 | 1203 | 1217 | 1224 | 1238 | 1259 | 1279 | 1279 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .14 | \$ 1314 | 1328 | 1335 | 1349 | 1363 | 1370 | 1384 | 1391 | 1405 | 1426 | 1446 | 1446 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .16 | \$ 1481 | 1495 | 1502 | 1516 | 1530 | 1537 | 1551 | 1558 | 1572 | 1592 | 1613 | 1613 | BALANCE POINT 2 DEG.F. |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 737 | 765 | 793 | 820 | 848 | 876 | 904 | 932 | 959 | 1015 | 1071 | 1071 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 813 | 841 | 849 | 887 | 925 | 952 | 980 | 1008 | 1036 | 1092 | 1147 | 1147 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .07 | \$ 897 | 925 | 952 | 980 | 1008 | 1036 | 1064 | 1092 | 1119 | 1175 | 1231 | 1231 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .08 | \$ 980 | 1008 | 1036 | 1064 | 1092 | 1119 | 1147 | 1175 | 1203 | 1259 | 1314 | 1314 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .09 | \$ 1064 | 1092 | 1119 | 1147 | 1175 | 1203 | 1231 | 1259 | 1286 | 1342 | 1398 | 1398 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .10 | \$ 1140 | 1168 | 1196 | 1224 | 1252 | 1279 | 1307 | 1335 | 1363 | 1419 | 1474 | 1474 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .12 | \$ 1307 | 1335 | 1363 | 1391 | 1415 | 1446 | 1474 | 1502 | 1530 | 1586 | 1641 | 1641 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .14 | \$ 1467 | 1495 | 1523 | 1551 | 1579 | 1606 | 1634 | 1662 | 1690 | 1745 | 1801 | 1801 | BALANCE POINT 12 DEG.F. |
| | .16 | \$ 1634 | 1662 | 1690 | 1718 | 1745 | 1773 | 1801 | 1829 | 1857 | 1912 | 1968 | 1968 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 904 | 946 | 987 | 1029 | 1071 | 1112 | 1154 | 1196 | 1238 | 1321 | 1405 | 1405 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 987 | 1029 | 1071 | 1112 | 1154 | 1196 | 1238 | 1279 | 1321 | 1405 | 1488 | 1488 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .07 | \$ 1064 | 1106 | 1147 | 1189 | 1231 | 1272 | 1314 | 1356 | 1398 | 1481 | 1565 | 1565 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .08 | \$ 1147 | 1189 | 1231 | 1272 | 1314 | 1356 | 1398 | 1439 | 1481 | 1565 | 1648 | 1648 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .09 | \$ 1231 | 1272 | 1314 | 1356 | 1398 | 1439 | 1481 | 1523 | 1565 | 1648 | 1732 | 1732 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .10 | \$ 1314 | 1356 | 1398 | 1439 | 1481 | 1523 | 1565 | 1606 | 1648 | 1732 | 1815 | 1815 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .12 | \$ 1474 | 1516 | 1558 | 1599 | 1641 | 1683 | 1725 | 1766 | 1808 | 1892 | 1975 | 1975 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .14 | \$ 1641 | 1683 | 1725 | 1766 | 1808 | 1850 | 1892 | 1933 | 1975 | 2059 | 2142 | 2142 | BALANCE POINT 20 DEG.F. |
| | .16 | \$ 1801 | 1843 | 1885 | 1926 | 1968 | 2010 | 2052 | 2093 | 2135 | 2219 | 2302 | 2302 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

\$.05 .06 .07 .08 .09 .10 .12 .14 .16
 .44 .53 .61 .70 .79 .88 .106 .123 .141

<--ELECTRIC RATE \$/KWH
 <--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION MOS42A INDOOR A42AO-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 43600 BTUH, 17.45 SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 37500 BTUH, 3.40 COP
 FURNACE TYPE: ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH |
|-------------------|-------------------------|
|-------------------|-------------------------|

40,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 486 | 1238 |
| .06 | S | 584 | 1488 |
| .07 | S | 681 | 1732 |
| .08 | S | 779 | 1982 |
| .09 | S | 876 | 2232 |
| .10 | S | 980 | 2476 |
| .12 | S | 1168 | 2977 |
| .14 | S | 1363 | 3471 |
| .16 | S | 1565 | 3965 |

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 598 | 1544 |
| .06 | S | 716 | 1857 |
| .07 | S | 834 | 2170 |
| .08 | S | 952 | 2476 |
| .09 | S | 1071 | 2789 |
| .10 | S | 1196 | 3095 |
| .12 | S | 1432 | 3721 |
| .14 | S | 1669 | 4340 |
| .16 | S | 1905 | 4959 |

BALANCE POINT 8- DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 709 | 1857 |
| .06 | S | 855 | 2232 |
| .07 | S | 994 | 2601 |
| .08 | S | 1140 | 2977 |
| .09 | S | 1279 | 3345 |
| .10 | S | 1419 | 3721 |
| .12 | S | 1704 | 4465 |
| .14 | S | 1989 | 5210 |
| .16 | S | 2274 | 5954 |

BALANCE POINT 4 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 841 | 2170 |
| .06 | S | 1008 | 2501 |
| .07 | S | 1182 | 3039 |
| .08 | S | 1349 | 3471 |
| .09 | S | 1516 | 3902 |
| .10 | S | 1690 | 4340 |
| .12 | S | 2024 | 5210 |
| .14 | S | 2358 | 6079 |
| .16 | S | 2698 | 6942 |

BALANCE POINT 13 DEG.F.

80,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1001 | 2476 |
| .06 | S | 1210 | 2977 |
| .07 | S | 1405 | 3471 |
| .08 | S | 1613 | 3965 |
| .09 | S | 1808 | 4465 |
| .10 | S | 2010 | 4959 |
| .12 | S | 2413 | 5954 |
| .14 | S | 2817 | 6942 |
| .16 | S | 3220 | 7936 |

BALANCE POINT 19 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|------|------|------|-----|
| S .05 | .06 | .07 | .08 | .09 | .10 | .11 | .12 | .14 | .16 |
| S .49 | .59 | .69 | .79 | .89 | .99 | 1.19 | 1.39 | 1.59 | |

| | |
|-------------------------|--------------------------------------|
| <--ELECTRIC RATE \$/KWH | <--THEORETICAL AIR CONDITIONING COST |
|-------------------------|--------------------------------------|

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: COMPRESSOR SECTION WOS42A INDOOR A42AO-A
COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 43600 BTUH 17.45 SEER
HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 37500 BTUH 3.40 COP
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 375 | 375 | 382 | 382 | 389 | 389 | 396 | 396 | 403 | 403 | 410 | 417 |
| | .06 | \$ 452 | 452 | 459 | 459 | 466 | 466 | 473 | 473 | 479 | 479 | 486 | 493 |
| | .07 | \$ 521 | 521 | 528 | 528 | 535 | 535 | 542 | 542 | 549 | 549 | 556 | 563 |
| | .08 | \$ 591 | 591 | 598 | 598 | 605 | 605 | 612 | 612 | 619 | 619 | 626 | 633 |
| | .09 | \$ 660 | 660 | 667 | 667 | 674 | 674 | 681 | 681 | 688 | 688 | 695 | 702 |
| | .10 | \$ 730 | 730 | 737 | 737 | 744 | 744 | 751 | 751 | 758 | 758 | 765 | 772 |
| | .11 | \$ 869 | 869 | 876 | 876 | 883 | 883 | 890 | 890 | 897 | 897 | 904 | 911 |
| | .12 | \$ 1008 | 1008 | 1015 | 1015 | 1022 | 1022 | 1029 | 1029 | 1036 | 1036 | 1043 | 1050 |
| | .13 | \$ 1147 | 1147 | 1154 | 1154 | 1161 | 1161 | 1168 | 1168 | 1175 | 1175 | 1182 | 1189 |
| | .16 | \$ 1147 | 1147 | 1154 | 1154 | 1161 | 1161 | 1168 | 1168 | 1175 | 1175 | 1182 | 1189 |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 424 | 431 | 431 | 438 | 438 | 445 | 452 | 452 | 459 | 459 | 466 | 479 |
| | .06 | \$ 500 | 507 | 507 | 514 | 514 | 521 | 528 | 528 | 535 | 535 | 542 | 556 |
| | .07 | \$ 577 | 584 | 584 | 591 | 591 | 598 | 605 | 605 | 612 | 612 | 619 | 633 |
| | .08 | \$ 660 | 667 | 667 | 674 | 674 | 681 | 688 | 688 | 695 | 695 | 702 | 716 |
| | .09 | \$ 737 | 744 | 744 | 751 | 751 | 758 | 765 | 765 | 772 | 772 | 779 | 793 |
| | .10 | \$ 820 | 827 | 827 | 834 | 834 | 841 | 848 | 848 | 855 | 855 | 862 | 876 |
| | .11 | \$ 973 | 980 | 980 | 987 | 987 | 994 | 1001 | 1001 | 1008 | 1008 | 1015 | 1029 |
| | .14 | \$ 1133 | 1140 | 1140 | 1147 | 1147 | 1154 | 1161 | 1161 | 1168 | 1168 | 1175 | 1189 |
| | .16 | \$ 1293 | 1300 | 1300 | 1307 | 1307 | 1314 | 1321 | 1321 | 1328 | 1328 | 1335 | 1349 |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 514 | 521 | 528 | 535 | 535 | 542 | 549 | 556 | 563 | 570 | 584 | 598 |
| | .06 | \$ 612 | 619 | 626 | 633 | 633 | 639 | 646 | 653 | 660 | 667 | 681 | 695 |
| | .07 | \$ 702 | 709 | 716 | 723 | 723 | 730 | 737 | 744 | 751 | 758 | 772 | 786 |
| | .08 | \$ 799 | 806 | 813 | 820 | 820 | 827 | 834 | 841 | 848 | 855 | 869 | 883 |
| | .09 | \$ 890 | 897 | 904 | 911 | 911 | 918 | 925 | 932 | 939 | 946 | 959 | 973 |
| | .10 | \$ 981 | 994 | 1001 | 1008 | 1008 | 1015 | 1022 | 1029 | 1036 | 1043 | 1057 | 1071 |
| | .12 | \$ 1175 | 1182 | 1189 | 1196 | 1196 | 1203 | 1210 | 1217 | 1224 | 1231 | 1245 | 1259 |
| | .14 | \$ 1363 | 1370 | 1377 | 1384 | 1384 | 1391 | 1398 | 1405 | 1412 | 1419 | 1432 | 1446 |
| | .16 | \$ 1551 | 1558 | 1565 | 1572 | 1572 | 1579 | 1586 | 1593 | 1599 | 1606 | 1620 | 1634 |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 605 | 619 | 633 | 639 | 653 | 667 | 681 | 688 | 702 | 716 | 737 | 765 |
| | .06 | \$ 709 | 723 | 737 | 744 | 758 | 772 | 786 | 793 | 806 | 820 | 841 | 869 |
| | .07 | \$ 806 | 820 | 834 | 841 | 855 | 869 | 883 | 890 | 904 | 918 | 939 | 966 |
| | .08 | \$ 911 | 925 | 939 | 946 | 959 | 973 | 987 | 994 | 1008 | 1022 | 1043 | 1071 |
| | .09 | \$ 1015 | 1029 | 1043 | 1050 | 1064 | 1078 | 1092 | 1099 | 1112 | 1126 | 1147 | 1175 |
| | .10 | \$ 1119 | 1133 | 1147 | 1154 | 1168 | 1182 | 1196 | 1203 | 1217 | 1231 | 1252 | 1279 |
| | .12 | \$ 1328 | 1342 | 1356 | 1363 | 1377 | 1391 | 1405 | 1412 | 1426 | 1439 | 1460 | 1488 |
| | .14 | \$ 1537 | 1551 | 1565 | 1572 | 1572 | 1579 | 1586 | 1593 | 1613 | 1620 | 1634 | 1669 |
| | .16 | \$ 1745 | 1759 | 1773 | 1780 | 1794 | 1808 | 1822 | 1829 | 1843 | 1857 | 1878 | 1905 |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 695 | 730 | 758 | 786 | 813 | 841 | 876 | 904 | 932 | 959 | 1022 | 1078 |
| | .06 | \$ 793 | 827 | 855 | 883 | 911 | 939 | 973 | 1001 | 1029 | 1057 | 1119 | 1175 |
| | .07 | \$ 890 | 925 | 952 | 980 | 1008 | 1036 | 1071 | 1099 | 1126 | 1154 | 1217 | 1272 |
| | .08 | \$ 987 | 1022 | 1050 | 1078 | 1106 | 1133 | 1168 | 1196 | 1224 | 1252 | 1314 | 1370 |
| | .09 | \$ 1085 | 1119 | 1147 | 1175 | 1203 | 1231 | 1266 | 1293 | 1321 | 1349 | 1412 | 1467 |
| | .10 | \$ 1187 | 1217 | 1245 | 1272 | 1300 | 1328 | 1363 | 1391 | 1419 | 1446 | 1509 | 1565 |
| | .12 | \$ 1377 | 1412 | 1439 | 1467 | 1495 | 1523 | 1558 | 1586 | 1613 | 1641 | 1704 | 1759 |
| | .14 | \$ 1572 | 1606 | 1634 | 1662 | 1690 | 1718 | 1752 | 1780 | 1808 | 1839 | 1899 | 1954 |
| | .16 | \$ 1773 | 1808 | 1836 | 1864 | 1892 | 1919 | 1954 | 1982 | 2010 | 2038 | 2100 | 2156 |
| 80,000 | \$ 758 | 862 | 973 | 1085 | 1189 | 1300 | 1405 | 1516 | 1627 | 1732 | 1947 | 2170 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 779 | 827 | 869 | 911 | 952 | 994 | 1036 | 1085 | 1126 | 1168 | 1252 | 1342 |
| | .06 | \$ 816 | 925 | 966 | 1008 | 1050 | 1092 | 1133 | 1182 | 1224 | 1266 | 1349 | 1439 |
| | .07 | \$ 973 | 1022 | 1064 | 1106 | 1147 | 1189 | 1231 | 1279 | 1321 | 1363 | 1446 | 1537 |
| | .08 | \$ 1071 | 1119 | 1161 | 1203 | 1245 | 1286 | 1328 | 1377 | 1419 | 1460 | 1544 | 1634 |
| | .09 | \$ 1168 | 1217 | 1259 | 1300 | 1342 | 1384 | 1426 | 1474 | 1516 | 1558 | 1641 | 1732 |
| | .10 | \$ 1260 | 1314 | 1356 | 1398 | 1439 | 1481 | 1523 | 1572 | 1613 | 1655 | 1739 | 1829 |
| | .12 | \$ 1460 | 1509 | 1551 | 1592 | 1634 | 1676 | 1718 | 1766 | 1808 | 1850 | 1933 | 2024 |
| | .14 | \$ 1655 | 1704 | 1745 | 1787 | 1829 | 1871 | 1912 | 1961 | 2003 | 2045 | 2128 | 2219 |
| | .16 | \$ 1843 | 1892 | 1933 | 1975 | 2017 | 2059 | 2100 | 2149 | 2191 | 2232 | 2316 | 2406 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .14 .16
s .49 .59 .69 .79 .89 .99 .139 .159

--ELECTRIC RATE \$/KWH
--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

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 HEAT PUMP MODEL: COMPRESSOR SECTION WOS42A INDOOR A42AO-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 43600 BTUH, 17.45 SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 37500 BTUH, 3.40 COP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | HEATING OIL COST - \$/GALLON |
|-------------------|-------------------------|------|------|------|------|------|------|------|------|------|------|------|---|--|
| 35,000 | | | | | | | | | | | | | | |
| .05 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .06 | \$ 382 | 389 | 396 | 396 | 403 | 410 | 417 | 417 | 424 | 431 | 431 | 431 | 438 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 459 | 466 | 473 | 473 | 479 | 486 | 493 | 493 | 500 | 507 | 507 | 514 | 514 | |
| .08 | \$ 528 | 535 | 542 | 542 | 549 | 556 | 563 | 563 | 570 | 577 | 577 | 584 | 584 | |
| .09 | \$ 598 | 605 | 612 | 612 | 619 | 626 | 633 | 633 | 639 | 646 | 646 | 653 | 653 | |
| .10 | \$ 667 | 674 | 681 | 681 | 688 | 695 | 702 | 702 | 709 | 716 | 716 | 723 | 723 | |
| .12 | \$ 137 | 744 | 751 | 751 | 758 | 765 | 772 | 772 | 779 | 786 | 786 | 793 | 793 | |
| .14 | \$ 876 | 883 | 890 | 890 | 897 | 904 | 911 | 911 | 918 | 925 | 925 | 932 | 932 | |
| .16 | \$ 1015 | 1022 | 1029 | 1029 | 1036 | 1043 | 1050 | 1050 | 1057 | 1064 | 1064 | 1071 | 1071 | |
| | \$ 1154 | 1161 | 1168 | 1168 | 1175 | 1182 | 1189 | 1189 | 1196 | 1203 | 1203 | 1210 | 1210 | |
| 40,000 | | | | | | | | | | | | | | |
| .05 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .06 | \$ 438 | 445 | 452 | 452 | 459 | 466 | 473 | 479 | 486 | 486 | 493 | 500 | 500 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 514 | 521 | 528 | 528 | 535 | 542 | 549 | 556 | 563 | 563 | 570 | 577 | 577 | |
| .08 | \$ 591 | 598 | 605 | 605 | 612 | 619 | 626 | 633 | 639 | 646 | 646 | 653 | 653 | |
| .09 | \$ 674 | 681 | 688 | 688 | 695 | 702 | 709 | 716 | 723 | 723 | 730 | 737 | 737 | |
| .10 | \$ 751 | 758 | 765 | 765 | 772 | 779 | 786 | 793 | 799 | 799 | 806 | 813 | 813 | |
| .12 | \$ 834 | 841 | 848 | 848 | 855 | 862 | 869 | 876 | 883 | 883 | 890 | 897 | 897 | |
| .14 | \$ 987 | 994 | 1001 | 1001 | 1008 | 1015 | 1022 | 1029 | 1036 | 1036 | 1043 | 1050 | 1050 | BALANCE POINT 63 DEG.F. |
| .16 | \$ 1147 | 1154 | 1161 | 1161 | 1168 | 1175 | 1182 | 1189 | 1196 | 1196 | 1203 | 1210 | 1210 | |
| | \$ 1307 | 1314 | 1321 | 1321 | 1328 | 1335 | 1342 | 1349 | 1356 | 1356 | 1363 | 1370 | 1370 | |
| 50,000 | | | | | | | | | | | | | | |
| .05 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .06 | \$ 535 | 542 | 549 | 563 | 570 | 584 | 591 | 598 | 612 | 619 | 626 | 639 | 639 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 633 | 639 | 646 | 660 | 667 | 681 | 688 | 695 | 709 | 716 | 723 | 737 | 737 | |
| .08 | \$ 723 | 730 | 737 | 751 | 758 | 772 | 779 | 786 | 799 | 806 | 813 | 827 | 827 | |
| .09 | \$ 820 | 827 | 834 | 848 | 855 | 869 | 876 | 883 | 897 | 904 | 911 | 925 | 925 | |
| .10 | \$ 918 | 918 | 925 | 939 | 946 | 959 | 966 | 973 | 987 | 994 | 1001 | 1015 | 1015 | |
| .12 | \$ 1008 | 1015 | 1022 | 1036 | 1043 | 1057 | 1064 | 1071 | 1085 | 1092 | 1099 | 1112 | 1112 | |
| .14 | \$ 1196 | 1203 | 1210 | 1224 | 1231 | 1245 | 1252 | 1259 | 1272 | 1279 | 1286 | 1300 | 1300 | BALANCE POINT 8- DEG.F. |
| .16 | \$ 1384 | 1391 | 1398 | 1412 | 1419 | 1432 | 1439 | 1446 | 1460 | 1467 | 1474 | 1488 | 1488 | |
| | \$ 1572 | 1579 | 1586 | 1599 | 1606 | 1620 | 1627 | 1634 | 1648 | 1655 | 1662 | 1676 | 1676 | |
| 60,000 | | | | | | | | | | | | | | |
| .05 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .06 | \$ 646 | 660 | 681 | 695 | 716 | 730 | 751 | 765 | 786 | 799 | 820 | 834 | 834 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 751 | 765 | 786 | 799 | 820 | 834 | 855 | 869 | 890 | 904 | 925 | 939 | 939 | |
| .08 | \$ 848 | 862 | 883 | 897 | 918 | 932 | 952 | 966 | 987 | 1001 | 1022 | 1036 | 1036 | |
| .09 | \$ 952 | 966 | 987 | 1001 | 1021 | 1036 | 1057 | 1071 | 1092 | 1106 | 1126 | 1140 | 1140 | |
| .10 | \$ 1057 | 1071 | 1092 | 1106 | 1126 | 1140 | 1161 | 1175 | 1196 | 1210 | 1231 | 1245 | 1245 | |
| .12 | \$ 1161 | 1175 | 1196 | 1210 | 1231 | 1245 | 1266 | 1279 | 1300 | 1314 | 1335 | 1349 | 1349 | |
| .14 | \$ 1370 | 1384 | 1405 | 1419 | 1439 | 1453 | 1474 | 1488 | 1509 | 1523 | 1544 | 1558 | 1558 | BALANCE POINT 4 DEG.F. |
| .16 | \$ 1579 | 1592 | 1613 | 1627 | 1648 | 1662 | 1683 | 1697 | 1718 | 1732 | 1752 | 1766 | 1766 | |
| | \$ 1787 | 1801 | 1822 | 1836 | 1857 | 1871 | 1892 | 1905 | 1926 | 1940 | 1961 | 1975 | 1975 | |
| 70,000 | | | | | | | | | | | | | | |
| .05 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .06 | \$ 786 | 827 | 876 | 918 | 959 | 1001 | 1043 | 1085 | 1126 | 1168 | 1210 | 1252 | 1252 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .07 | \$ 883 | 925 | 973 | 1015 | 1057 | 1099 | 1140 | 1182 | 1224 | 1266 | 1307 | 1349 | 1349 | |
| .08 | \$ 980 | 1022 | 1071 | 1112 | 1154 | 1196 | 1238 | 1279 | 1321 | 1363 | 1405 | 1446 | 1446 | |
| .09 | \$ 1078 | 1119 | 1168 | 1210 | 1252 | 1293 | 1335 | 1377 | 1419 | 1460 | 1502 | 1544 | 1544 | |
| .10 | \$ 1175 | 1217 | 1266 | 1307 | 1349 | 1391 | 1432 | 1474 | 1516 | 1558 | 1599 | 1641 | 1641 | |
| .12 | \$ 1272 | 1314 | 1363 | 1405 | 1446 | 1488 | 1530 | 1572 | 1613 | 1655 | 1697 | 1739 | 1739 | |
| .14 | \$ 1467 | 1509 | 1558 | 1599 | 1641 | 1683 | 1725 | 1766 | 1808 | 1850 | 1892 | 1933 | 1933 | |
| .16 | \$ 1662 | 1704 | 1752 | 1794 | 1836 | 1878 | 1919 | 1961 | 2003 | 2045 | 2086 | 2128 | 2128 | BALANCE POINT 13 DEG.F. |
| | \$ 1864 | 1905 | 1954 | 1996 | 2038 | 2079 | 2121 | 2163 | 2205 | 2246 | 2288 | 2330 | 2330 | |
| 80,000 | | | | | | | | | | | | | | |
| .05 | \$ 911 | 973 | 1036 | 1099 | 1161 | 1224 | 1286 | 1349 | 1412 | 1474 | 1537 | 1599 | 1599 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 1008 | 1071 | 1133 | 1196 | 1259 | 1321 | 1384 | 1446 | 1509 | 1572 | 1634 | 1697 | 1697 | |
| .07 | \$ 1106 | 1168 | 1231 | 1293 | 1356 | 1419 | 1481 | 1544 | 1606 | 1669 | 1732 | 1794 | 1794 | |
| .08 | \$ 1203 | 1266 | 1328 | 1391 | 1453 | 1516 | 1579 | 1641 | 1704 | 1766 | 1829 | 1892 | 1892 | |
| .09 | \$ 1300 | 1363 | 1426 | 1488 | 1551 | 1613 | 1676 | 1739 | 1801 | 1864 | 1926 | 1989 | 1989 | |
| .10 | \$ 1398 | 1460 | 1523 | 1588 | 1648 | 1711 | 1773 | 1836 | 1899 | 1961 | 2024 | 2086 | 2086 | |
| .12 | \$ 1592 | 1655 | 1718 | 1780 | 1843 | 1905 | 1968 | 2031 | 2093 | 2156 | 2219 | 2281 | 2281 | |
| .14 | \$ 1787 | 1850 | 1912 | 1975 | 2038 | 2100 | 2163 | 2225 | 2288 | 2351 | 2413 | 2476 | 2538 | BALANCE POINT 19 DEG.F. |
| .16 | \$ 1975 | 2038 | 2100 | 2163 | 2225 | 2288 | 2351 | 2413 | 2476 | 2538 | 2601 | 2664 | 2664 | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------|
| .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 | --ELECTRIC RATE \$/KWH |
| \$ 49 | 59 | 69 | 79 | 89 | 99 | 119 | 139 | 159 | --THEORETICAL AIR CONDITIONING COST |

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5

HEAT PUMP MODEL: COMPRESSOR SECTION MOS42A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 43600 BTUH 17.45 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 37500 BTUH 3.40 COP
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWB | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 | PROPSANE GAS COST - \$/GALLON |
|-------------------|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|---|
| 35,000 | | | | | | | | | | | | | | |
| | \$ | 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ | 396 | 396 | 403 | 403 | 410 | 417 | 417 | 424 | 424 | 431 | 438 | 438 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ | 473 | 473 | 479 | 479 | 486 | 493 | 493 | 500 | 500 | 507 | 514 | 514 | S PER YEAR |
| .07 | \$ | 542 | 542 | 549 | 549 | 556 | 563 | 563 | 570 | 570 | 577 | 584 | 584 | |
| .08 | \$ | 612 | 612 | 619 | 619 | 626 | 633 | 633 | 639 | 639 | 646 | 653 | 653 | |
| .09 | \$ | 681 | 681 | 688 | 688 | 695 | 702 | 702 | 709 | 709 | 716 | 723 | 723 | |
| .10 | \$ | 751 | 751 | 758 | 758 | 765 | 772 | 772 | 779 | 779 | 786 | 793 | 793 | |
| .12 | \$ | 890 | 890 | 897 | 897 | 904 | 911 | 911 | 918 | 918 | 925 | 932 | 932 | |
| .14 | \$ | 1029 | 1029 | 1036 | 1036 | 1043 | 1050 | 1050 | 1057 | 1057 | 1064 | 1071 | 1071 | |
| .16 | \$ | 1168 | 1168 | 1175 | 1175 | 1182 | 1189 | 1189 | 1196 | 1196 | 1203 | 1210 | 1210 | |
| 40,000 | | | | | | | | | | | | | | |
| | \$ | 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ | 452 | 452 | 459 | 466 | 466 | 473 | 479 | 479 | 486 | 493 | 500 | 500 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ | 528 | 528 | 535 | 542 | 542 | 549 | 556 | 556 | 563 | 570 | 577 | 577 | S PER YEAR |
| .07 | \$ | 605 | 605 | 612 | 619 | 619 | 626 | 633 | 633 | 640 | 646 | 653 | 653 | |
| .08 | \$ | 688 | 688 | 702 | 702 | 709 | 716 | 716 | 723 | 730 | 737 | 737 | | |
| .09 | \$ | 765 | 765 | 772 | 779 | 779 | 786 | 793 | 793 | 799 | 806 | 813 | 813 | |
| .10 | \$ | 848 | 848 | 855 | 862 | 862 | 869 | 876 | 876 | 883 | 890 | 897 | 897 | |
| .12 | \$ | 1001 | 1001 | 1008 | 1015 | 1015 | 1022 | 1029 | 1029 | 1036 | 1043 | 1050 | 1050 | |
| .14 | \$ | 1161 | 1161 | 1168 | 1175 | 1175 | 1182 | 1189 | 1189 | 1196 | 1203 | 1210 | 1210 | BALANCE POINT 63 DEG.F. |
| .16 | \$ | 1321 | 1321 | 1328 | 1335 | 1335 | 1342 | 1349 | 1349 | 1356 | 1363 | 1370 | 1370 | |
| 50,000 | | | | | | | | | | | | | | |
| | \$ | 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ | 556 | 563 | 570 | 577 | 584 | 591 | 598 | 605 | 612 | 626 | 639 | 639 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ | 653 | 660 | 667 | 674 | 681 | 688 | 695 | 702 | 709 | 723 | 737 | 737 | S PER YEAR |
| .07 | \$ | 744 | 751 | 758 | 765 | 772 | 779 | 786 | 793 | 799 | 813 | 827 | 827 | |
| .08 | \$ | 841 | 848 | 855 | 862 | 869 | 876 | 883 | 890 | 897 | 911 | 925 | 925 | |
| .09 | \$ | 932 | 939 | 946 | 952 | 959 | 966 | 973 | 980 | 987 | 1001 | 1015 | 1015 | |
| .10 | \$ | 1029 | 1036 | 1043 | 1050 | 1057 | 1064 | 1071 | 1078 | 1085 | 1099 | 1112 | 1112 | |
| .12 | \$ | 1217 | 1224 | 1231 | 1238 | 1245 | 1252 | 1259 | 1266 | 1272 | 1286 | 1300 | 1300 | |
| .14 | \$ | 1405 | 1412 | 1419 | 1426 | 1432 | 1439 | 1446 | 1453 | 1460 | 1474 | 1488 | 1488 | BALANCE POINT 8- DEG.F. |
| .16 | \$ | 1592 | 1599 | 1606 | 1613 | 1620 | 1627 | 1634 | 1641 | 1648 | 1662 | 1676 | 1676 | |
| 60,000 | | | | | | | | | | | | | | |
| | \$ | 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ | 681 | 695 | 709 | 723 | 737 | 751 | 765 | 772 | 786 | 813 | 841 | 841 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ | 786 | 799 | 813 | 827 | 841 | 855 | 869 | 876 | 890 | 918 | 946 | 946 | S PER YEAR |
| .07 | \$ | 883 | 897 | 911 | 925 | 939 | 952 | 966 | 973 | 987 | 1015 | 1043 | 1043 | |
| .08 | \$ | 987 | 1001 | 1015 | 1029 | 1043 | 1057 | 1071 | 1078 | 1092 | 1119 | 1147 | 1147 | |
| .09 | \$ | 1092 | 1106 | 1119 | 1133 | 1147 | 1161 | 1175 | 1182 | 1196 | 1224 | 1252 | 1252 | |
| .10 | \$ | 1196 | 1210 | 1224 | 1238 | 1245 | 1252 | 1266 | 1279 | 1286 | 1300 | 1328 | 1356 | |
| .12 | \$ | 1405 | 1419 | 1432 | 1446 | 1460 | 1474 | 1488 | 1495 | 1509 | 1537 | 1565 | 1565 | |
| .14 | \$ | 1613 | 1627 | 1641 | 1655 | 1669 | 1683 | 1697 | 1704 | 1718 | 1745 | 1773 | 1773 | |
| .16 | \$ | 1822 | 1836 | 1850 | 1864 | 1878 | 1892 | 1905 | 1912 | 1926 | 1954 | 1982 | 1982 | BALANCE POINT 4 DEG.F. |
| 70,000 | | | | | | | | | | | | | | |
| | \$ | 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ | 876 | 911 | 946 | 973 | 1008 | 1036 | 1071 | 1106 | 1133 | 1203 | 1266 | 1266 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ | 973 | 1008 | 1043 | 1071 | 1106 | 1133 | 1168 | 1203 | 1231 | 1300 | 1363 | 1363 | S PER YEAR |
| .07 | \$ | 1071 | 1106 | 1140 | 1168 | 1203 | 1231 | 1266 | 1300 | 1328 | 1398 | 1460 | 1460 | |
| .08 | \$ | 1168 | 1203 | 1238 | 1266 | 1300 | 1328 | 1363 | 1398 | 1426 | 1495 | 1558 | 1558 | |
| .09 | \$ | 1266 | 1300 | 1335 | 1363 | 1398 | 1426 | 1460 | 1495 | 1523 | 1592 | 1655 | 1655 | |
| .10 | \$ | 1363 | 1398 | 1432 | 1460 | 1495 | 1523 | 1558 | 1592 | 1620 | 1690 | 1752 | 1752 | |
| .12 | \$ | 1558 | 1582 | 1627 | 1655 | 1690 | 1718 | 1752 | 1787 | 1815 | 1885 | 1947 | 1947 | |
| .14 | \$ | 1752 | 1787 | 1822 | 1850 | 1885 | 1912 | 1947 | 1982 | 2010 | 2079 | 2142 | 2142 | |
| .16 | \$ | 1954 | 1989 | 2024 | 2052 | 2086 | 2114 | 2149 | 2184 | 2212 | 2281 | 2344 | 2344 | BALANCE POINT 13 DEG.F. |
| 80,000 | | | | | | | | | | | | | | |
| | \$ | 1426 | 1551 | 1669 | 1787 | 1905 | 2024 | 2142 | 2260 | 2385 | 2622 | 2858 | 2858 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ | 1050 | 1092 | 1140 | 1189 | 1238 | 1286 | 1328 | 1377 | 1426 | 1523 | 1613 | 1613 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ | 1147 | 1189 | 1238 | 1286 | 1335 | 1384 | 1426 | 1474 | 1523 | 1620 | 1711 | 1711 | S PER YEAR |
| .07 | \$ | 1245 | 1286 | 1335 | 1384 | 1432 | 1481 | 1523 | 1572 | 1620 | 1718 | 1808 | 1808 | |
| .08 | \$ | 1342 | 1384 | 1432 | 1481 | 1530 | 1579 | 1620 | 1669 | 1718 | 1815 | 1905 | 1905 | |
| .09 | \$ | 1439 | 1481 | 1529 | 1579 | 1627 | 1676 | 1718 | 1766 | 1815 | 1912 | 2003 | 2003 | |
| .10 | \$ | 1537 | 1579 | 1627 | 1676 | 1725 | 1773 | 1815 | 1864 | 1912 | 2010 | 2100 | 2100 | |
| .12 | \$ | 1732 | 1773 | 1822 | 1871 | 1919 | 1968 | 2010 | 2059 | 2107 | 2205 | 2295 | 2295 | |
| .14 | \$ | 1926 | 1968 | 2017 | 2065 | 2114 | 2163 | 2205 | 2253 | 2302 | 2399 | 2490 | 2490 | |
| .16 | \$ | 2114 | 2156 | 2205 | 2253 | 2302 | 2351 | 2392 | 2441 | 2490 | 2587 | 2678 | 2678 | BALANCE POINT 19 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
| \$ 49 | 59 | 69 | 79 | 89 | 99 | 119 | 139 | 159 |

| | |
|-------------------------|--------------------------------------|
| <--ELECTRIC RATE \$/KWB | <--THEORETICAL AIR CONDITIONING COST |
|-------------------------|--------------------------------------|

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL-FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 24UHPOA/A30AO-A
 HEAT PUMP MODEL: OUTDOOR 24UHPOA INDOOR A30AO-A
 ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69
 ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, BSPP 6.40 MIN.DHR REG IV
 BTUH (17) 12500, COP(17) 1.90
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

| HEAT LOSS BTUH | ELC. COST \$/KWH | --- THEORETICAL ANNUAL HEATING COST --- | |
|-------------------|------------------------|---|-------------------------|
| | | HEAT PUMP WITH ELECTRIC HEAT | ELECTRIC HEAT ONLY |
| 25,000 | | | |
| .05 | \$ 473 | 772 | |
| .06 | \$ 570 | 925 | |
| .07 | \$ 667 | 1085 | |
| .08 | \$ 765 | 1238 | |
| .09 | \$ 853 | 1391 | |
| .10 | \$ 952 | 1544 | |
| .12 | \$ 1147 | 1857 | BALANCE POINT 16 DEG.F. |
| .14 | \$ 1335 | 2170 | |
| .16 | \$ 1523 | 2476 | |
| 30,000 | | | |
| .05 | \$ 577 | 925 | |
| .06 | \$ 695 | 1112 | |
| .07 | \$ 806 | 1300 | |
| .08 | \$ 925 | 1488 | |
| .09 | \$ 1043 | 1669 | |
| .10 | \$ 1154 | 1857 | |
| .12 | \$ 1384 | 2232 | BALANCE POINT 20 DEG.F. |
| .14 | \$ 1613 | 2601 | |
| .16 | \$ 1843 | 2977 | |
| 35,000 | | | |
| .05 | \$ 681 | 1085 | |
| .06 | \$ 820 | 1300 | |
| .07 | \$ 952 | 1516 | |
| .08 | \$ 1092 | 1732 | |
| .09 | \$ 1224 | 1947 | |
| .10 | \$ 1363 | 2170 | |
| .12 | \$ 1634 | 2601 | |
| .14 | \$ 1912 | 3039 | BALANCE POINT 24 DEG.F. |
| .16 | \$ 2191 | 3471 | |
| 40,000 | | | |
| .05 | \$ 793 | 1238 | |
| .06 | \$ 952 | 1488 | |
| .07 | \$ 1106 | 1732 | |
| .08 | \$ 1272 | 1982 | |
| .09 | \$ 1426 | 2232 | |
| .10 | \$ 1579 | 2476 | |
| .12 | \$ 1899 | 2977 | |
| .14 | \$ 2212 | 3471 | |
| .16 | \$ 2532 | 3965 | BALANCE POINT 27 DEG.F. |
| 50,000 | | | |
| .05 | \$ 1029 | 1544 | |
| .06 | \$ 1231 | 1857 | |
| .07 | \$ 1439 | 2170 | |
| .08 | \$ 1648 | 2476 | |
| .09 | \$ 1850 | 2789 | |
| .10 | \$ 2053 | 3095 | |
| .12 | \$ 2469 | 3721 | |
| .14 | \$ 2879 | 4340 | |
| .16 | \$ 3290 | 4959 | BALANCE POINT 31 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
 .49 .59 .69 .79 .89 .99 .118 .138 .158

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 24UHPOA/A30AO-A
 HEAT PUMP MODEL: OUTDOOR 24UHPOA INDOOR A30AO-A
 ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69
 ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, EERPF 6.40 MIN.DHR REG IV
 BTUH (17) 12500, COP(17) 1.90
 FURNACE TYPE: NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|---|---|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | |
| 25,000 | \$ 236 | 271 | 299 | 333 | 368 | 403 | 438 | 473 | 507 | 542 | 605 | 674 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 347 | 354 | 368 | 375 | 389 | 396 | 410 | 417 | 431 | 438 | 459 | 479 |
| | .06 | \$ 396 | 403 | 417 | 424 | 438 | 445 | 459 | 466 | 479 | 486 | 507 | 528 |
| | .07 | \$ 452 | 459 | 473 | 479 | 493 | 500 | 514 | 521 | 535 | 542 | 563 | 584 |
| | .08 | \$ 507 | 514 | 528 | 535 | 549 | 556 | 570 | 577 | 591 | 598 | 619 | 639 |
| | .09 | \$ 563 | 570 | 584 | 591 | 605 | 612 | 626 | 633 | 646 | 653 | 674 | 695 |
| | .10 | \$ 612 | 619 | 633 | 639 | 653 | 660 | 674 | 681 | 695 | 702 | 723 | 744 |
| | .12 | \$ 723 | 730 | 744 | 751 | 765 | 772 | 786 | 793 | 806 | 813 | 834 | 855 |
| | .14 | \$ 827 | 834 | 848 | 855 | 869 | 876 | 890 | 897 | 911 | 918 | 939 | 959 |
| | .16 | \$ 939 | 946 | 959 | 966 | 980 | 987 | 1001 | 1008 | 1022 | 1029 | 1050 | 1071 |
| | | | | | | | | | | | | | BALANCE POINT 16 DEG.F. |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 382 | 403 | 417 | 431 | 452 | 466 | 479 | 500 | 514 | 528 | 563 | 591 |
| | .06 | \$ 438 | 459 | 473 | 486 | 507 | 521 | 535 | 556 | 570 | 584 | 619 | 646 |
| | .07 | \$ 493 | 514 | 528 | 542 | 563 | 577 | 591 | 612 | 626 | 639 | 674 | 702 |
| | .08 | \$ 549 | 570 | 584 | 598 | 619 | 633 | 646 | 667 | 681 | 695 | 730 | 758 |
| | .09 | \$ 598 | 619 | 633 | 646 | 667 | 681 | 695 | 716 | 730 | 744 | 779 | 806 |
| | .10 | \$ 653 | 674 | 688 | 702 | 723 | 737 | 751 | 772 | 786 | 799 | 834 | 862 |
| | .12 | \$ 765 | 786 | 799 | 813 | 834 | 848 | 862 | 883 | 897 | 911 | 946 | 973 |
| | .14 | \$ 869 | 890 | 904 | 918 | 939 | 952 | 966 | 987 | 1001 | 1015 | 1050 | 1078 |
| | .16 | \$ 980 | 1001 | 1015 | 1029 | 1050 | 1064 | 1078 | 1099 | 1112 | 1126 | 1161 | 1189 |
| | | | | | | | | | | | | | BALANCE POINT 20 DEG.F. |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 417 | 445 | 466 | 486 | 514 | 535 | 563 | 584 | 612 | 633 | 681 | 730 |
| | .06 | \$ 473 | 500 | 521 | 542 | 570 | 591 | 619 | 639 | 667 | 688 | 737 | 786 |
| | .07 | \$ 521 | 549 | 570 | 591 | 619 | 639 | 667 | 688 | 716 | 737 | 786 | 834 |
| | .08 | \$ 570 | 598 | 619 | 639 | 667 | 688 | 716 | 737 | 765 | 786 | 834 | 883 |
| | .09 | \$ 619 | 646 | 667 | 688 | 716 | 737 | 765 | 786 | 813 | 834 | 883 | 932 |
| | .10 | \$ 674 | 702 | 723 | 744 | 772 | 793 | 820 | 841 | 869 | 890 | 939 | 987 |
| | .12 | \$ 772 | 799 | 820 | 841 | 869 | 890 | 918 | 939 | 966 | 987 | 1036 | 1085 |
| | .14 | \$ 876 | 904 | 925 | 946 | 973 | 994 | 1022 | 1043 | 1071 | 1092 | 1140 | 1189 |
| | .16 | \$ 973 | 1001 | 1022 | 1043 | 1071 | 1092 | 1119 | 1140 | 1168 | 1189 | 1238 | 1286 |
| | | | | | | | | | | | | | BALANCE POINT 24 DEG.F. |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 452 | 486 | 521 | 556 | 591 | 619 | 653 | 688 | 723 | 758 | 827 | 890 |
| | .06 | \$ 493 | 528 | 563 | 598 | 633 | 660 | 695 | 730 | 765 | 799 | 869 | 932 |
| | .07 | \$ 535 | 570 | 605 | 639 | 674 | 702 | 737 | 772 | 806 | 841 | 911 | 973 |
| | .08 | \$ 577 | 612 | 646 | 681 | 716 | 744 | 779 | 813 | 848 | 883 | 952 | 1015 |
| | .09 | \$ 619 | 653 | 688 | 723 | 758 | 786 | 820 | 855 | 890 | 925 | 994 | 1057 |
| | .10 | \$ 660 | 695 | 730 | 765 | 799 | 827 | 862 | 897 | 932 | 966 | 1036 | 1099 |
| | .12 | \$ 744 | 779 | 813 | 848 | 883 | 911 | 946 | 980 | 1015 | 1050 | 1119 | 1182 |
| | .14 | \$ 834 | 869 | 904 | 939 | 973 | 1001 | 1036 | 1071 | 1106 | 1140 | 1210 | 1272 |
| | .16 | \$ 918 | 952 | 987 | 1022 | 1057 | 1085 | 1119 | 1154 | 1189 | 1224 | 1293 | 1356 |
| | | | | | | | | | | | | | BALANCE POINT 27 DEG.F. |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 556 | 598 | 639 | 681 | 723 | 765 | 806 | 848 | 890 | 932 | 1022 | 1106 |
| | .06 | \$ 605 | 646 | 688 | 730 | 772 | 813 | 855 | 897 | 939 | 980 | 1071 | 1154 |
| | .07 | \$ 660 | 702 | 744 | 786 | 827 | 869 | 911 | 952 | 994 | 1036 | 1126 | 1210 |
| | .08 | \$ 709 | 751 | 793 | 834 | 876 | 918 | 959 | 1001 | 1043 | 1085 | 1175 | 1259 |
| | .09 | \$ 758 | 799 | 841 | 883 | 925 | 966 | 1008 | 1050 | 1092 | 1133 | 1224 | 1307 |
| | .10 | \$ 813 | 855 | 897 | 939 | 980 | 1022 | 1064 | 1106 | 1147 | 1189 | 1279 | 1363 |
| | .12 | \$ 911 | 952 | 994 | 1036 | 1078 | 1119 | 1161 | 1203 | 1245 | 1286 | 1371 | 1460 |
| | .14 | \$ 1015 | 1057 | 1099 | 1140 | 1182 | 1224 | 1266 | 1307 | 1349 | 1391 | 1481 | 1565 |
| | .16 | \$ 1119 | 1161 | 1203 | 1245 | 1286 | 1328 | 1370 | 1412 | 1453 | 1495 | 1586 | 1669 |
| | | | | | | | | | | | | | BALANCE POINT 31 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
 .49 .59 .69 .79 .89 .99 .118 .138 .158

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 24UHPOA INDOOR A30AO-A
 ARI RATED COOLING CAP.: BTUH(95) 24000 SEER 9.69
 ARI RATED HEATING CAP.: BTUH (47) 24800 COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV
 BTUH (17) 12500 COP(17) 1.90
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | KILOC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | |
|-------------------|--------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 |
| 25,000 | \$ 340 | 389 | 438 | 486 | 535 | 584 | 633 | 681 | 730 | 779 | 827 | 876 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 375 | 389 | 403 | 424 | 438 | 452 | 466 | 479 | 493 | 514 | 528 | 542 |
| | .06 | \$ 424 | 438 | 452 | 473 | 486 | 500 | 514 | 528 | 542 | 563 | 577 | 591 |
| | .07 | \$ 479 | 493 | 507 | 528 | 542 | 556 | 570 | 584 | 598 | 619 | 633 | 646 |
| | .08 | \$ 535 | 549 | 563 | 584 | 598 | 612 | 626 | 639 | 653 | 674 | 688 | 702 |
| | .09 | \$ 591 | 605 | 619 | 639 | 653 | 667 | 681 | 695 | 709 | 730 | 744 | 758 |
| | .10 | \$ 639 | 653 | 667 | 688 | 702 | 716 | 730 | 744 | 758 | 779 | 793 | 806 |
| | .12 | \$ 751 | 765 | 779 | 799 | 813 | 827 | 841 | 855 | 869 | 890 | 904 | 918 |
| | .14 | \$ 855 | 869 | 883 | 904 | 918 | 932 | 946 | 959 | 973 | 994 | 1008 | 1022 |
| | .16 | \$ 966 | 980 | 994 | 1015 | 1029 | 1043 | 1057 | 1071 | 1085 | 1106 | 1119 | 1133 |
| 30,000 | \$ 410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 431 | 459 | 479 | 500 | 528 | 549 | 577 | 598 | 619 | 646 | 667 | 688 |
| | .06 | \$ 486 | 514 | 535 | 556 | 584 | 605 | 633 | 653 | 674 | 702 | 723 | 744 |
| | .07 | \$ 542 | 570 | 591 | 612 | 639 | 660 | 688 | 709 | 730 | 758 | 779 | 799 |
| | .08 | \$ 598 | 626 | 646 | 667 | 695 | 716 | 744 | 765 | 786 | 813 | 834 | 855 |
| | .09 | \$ 646 | 674 | 695 | 716 | 744 | 765 | 793 | 813 | 834 | 862 | 883 | 904 |
| | .10 | \$ 702 | 730 | 751 | 772 | 799 | 820 | 848 | 869 | 890 | 918 | 939 | 959 |
| | .12 | \$ 813 | 841 | 862 | 883 | 911 | 932 | 959 | 980 | 1001 | 1029 | 1050 | 1071 |
| | .14 | \$ 918 | 946 | 966 | 987 | 1015 | 1036 | 1064 | 1085 | 1106 | 1133 | 1154 | 1175 |
| | .16 | \$ 1029 | 1057 | 1078 | 1099 | 1126 | 1147 | 1175 | 1196 | 1217 | 1245 | 1266 | 1286 |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 493 | 528 | 563 | 598 | 633 | 667 | 702 | 730 | 765 | 799 | 834 | 869 |
| | .06 | \$ 549 | 584 | 619 | 653 | 688 | 723 | 758 | 786 | 820 | 855 | 890 | 925 |
| | .07 | \$ 598 | 633 | 667 | 702 | 737 | 772 | 806 | 834 | 869 | 904 | 939 | 973 |
| | .08 | \$ 646 | 681 | 716 | 751 | 786 | 820 | 855 | 883 | 918 | 952 | 987 | 1022 |
| | .09 | \$ 695 | 730 | 765 | 799 | 834 | 869 | 904 | 932 | 966 | 1001 | 1036 | 1071 |
| | .10 | \$ 751 | 786 | 820 | 855 | 890 | 925 | 959 | 987 | 1022 | 1057 | 1092 | 1126 |
| | .12 | \$ 848 | 883 | 918 | 952 | 987 | 1022 | 1057 | 1085 | 1119 | 1154 | 1189 | 1224 |
| | .14 | \$ 952 | 987 | 1022 | 1057 | 1092 | 1126 | 1161 | 1189 | 1224 | 1259 | 1293 | 1328 |
| | .16 | \$ 1050 | 1085 | 1119 | 1154 | 1189 | 1224 | 1259 | 1286 | 1321 | 1356 | 1391 | 1426 |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 556 | 605 | 653 | 702 | 751 | 799 | 848 | 897 | 946 | 994 | 1043 | 1099 |
| | .06 | \$ 598 | 646 | 695 | 744 | 793 | 841 | 890 | 939 | 987 | 1036 | 1085 | 1140 |
| | .07 | \$ 639 | 688 | 737 | 786 | 834 | 883 | 932 | 980 | 1029 | 1078 | 1126 | 1182 |
| | .08 | \$ 681 | 730 | 779 | 827 | 876 | 925 | 973 | 1022 | 1071 | 1119 | 1168 | 1224 |
| | .09 | \$ 723 | 772 | 820 | 869 | 918 | 966 | 1015 | 1064 | 1112 | 1161 | 1210 | 1266 |
| | .10 | \$ 765 | 813 | 862 | 911 | 959 | 1008 | 1057 | 1106 | 1154 | 1203 | 1252 | 1307 |
| | .12 | \$ 848 | 897 | 946 | 994 | 1043 | 1092 | 1140 | 1189 | 1238 | 1286 | 1335 | 1391 |
| | .14 | \$ 939 | 987 | 1036 | 1085 | 1133 | 1182 | 1231 | 1279 | 1328 | 1377 | 1426 | 1481 |
| | .16 | \$ 1022 | 1071 | 1119 | 1168 | 1217 | 1266 | 1314 | 1363 | 1412 | 1460 | 1509 | 1565 |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 681 | 744 | 806 | 869 | 932 | 987 | 1050 | 1112 | 1175 | 1238 | 1293 | 1356 |
| | .06 | \$ 730 | 793 | 855 | 918 | 980 | 1036 | 1099 | 1161 | 1224 | 1286 | 1342 | 1405 |
| | .07 | \$ 786 | 848 | 911 | 973 | 1036 | 1092 | 1154 | 1217 | 1279 | 1342 | 1398 | 1460 |
| | .08 | \$ 834 | 897 | 959 | 1022 | 1085 | 1140 | 1203 | 1266 | 1328 | 1391 | 1446 | 1509 |
| | .09 | \$ 883 | 946 | 1008 | 1071 | 1133 | 1189 | 1252 | 1314 | 1377 | 1439 | 1495 | 1558 |
| | .10 | \$ 939 | 1001 | 1064 | 1126 | 1189 | 1245 | 1307 | 1370 | 1432 | 1495 | 1551 | 1613 |
| | .12 | \$ 1036 | 1099 | 1161 | 1224 | 1286 | 1342 | 1405 | 1467 | 1530 | 1592 | 1648 | 1711 |
| | .14 | \$ 1140 | 1203 | 1266 | 1328 | 1391 | 1446 | 1509 | 1572 | 1634 | 1697 | 1752 | 1815 |
| | .16 | \$ 1245 | 1307 | 1370 | 1432 | 1495 | 1551 | 1613 | 1676 | 1739 | 1801 | 1857 | 1919 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
 \$ 49 59 69 79 89 99 118 138 158

--ELECTRIC RATE \$/KWH
 --THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 24UHPOA INDOOR A30AO-A
 ARI RATED COOLING CAP.: BTUH(95) 24000 SEER 9.69
 ARI RATED HEATING CAP.: BTUH (47) 24800 COP(47) 2.90, BSPP 6.40 MIN.DHR REG IV
 BTUH (17) 12500, COP(17) 1.90
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELRC COST \$/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | |
|-------------------|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
| 25,000 | \$ 445 | 479 | 521 | 556 | 591 | 633 | 667 | 702 | 744 | 813 | 890 | 890 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 410 | 417 | 431 | 445 | 452 | 466 | 479 | 486 | 500 | 521 | 549 | 549 |
| | .06 | \$ 459 | 466 | 479 | 493 | 500 | 514 | 528 | 535 | 549 | 570 | 598 | 598 |
| | .07 | \$ 514 | 521 | 535 | 549 | 556 | 570 | 584 | 591 | 605 | 626 | 653 | 653 |
| | .08 | \$ 570 | 577 | 591 | 605 | 612 | 626 | 639 | 646 | 660 | 681 | 709 | 709 |
| | .09 | \$ 626 | 633 | 646 | 660 | 667 | 681 | 695 | 702 | 716 | 737 | 765 | 765 |
| | .10 | \$ 674 | 681 | 695 | 709 | 716 | 730 | 744 | 751 | 765 | 786 | 813 | 813 |
| | .12 | \$ 786 | 793 | 806 | 820 | 827 | 841 | 855 | 862 | 876 | 897 | 925 | 925 |
| | .14 | \$ 890 | 897 | 911 | 925 | 932 | 946 | 959 | 966 | 980 | 1001 | 1029 | 1029 |
| | .16 | \$ 1001 | 1008 | 1022 | 1036 | 1043 | 1057 | 1071 | 1078 | 1092 | 1112 | 1140 | 1140 |
| 30,000 | \$ 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 486 | 500 | 521 | 535 | 556 | 570 | 591 | 605 | 626 | 660 | 695 | 695 |
| | .06 | \$ 542 | 556 | 577 | 591 | 612 | 626 | 646 | 660 | 681 | 716 | 751 | 751 |
| | .07 | \$ 598 | 612 | 633 | 646 | 667 | 681 | 702 | 716 | 737 | 772 | 806 | 806 |
| | .08 | \$ 653 | 667 | 688 | 702 | 723 | 737 | 758 | 772 | 793 | 827 | 862 | 862 |
| | .09 | \$ 702 | 716 | 731 | 751 | 772 | 786 | 806 | 820 | 841 | 876 | 911 | 911 |
| | .10 | \$ 758 | 772 | 793 | 806 | 827 | 841 | 862 | 876 | 897 | 932 | 966 | 966 |
| | .12 | \$ 869 | 883 | 904 | 918 | 939 | 952 | 973 | 987 | 1008 | 1043 | 1078 | 1078 |
| | .14 | \$ 973 | 987 | 1008 | 1022 | 1043 | 1057 | 1078 | 1092 | 1112 | 1147 | 1182 | 1182 |
| | .16 | \$ 1085 | 1099 | 1119 | 1133 | 1154 | 1168 | 1189 | 1203 | 1224 | 1259 | 1293 | 1293 |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 563 | 591 | 619 | 646 | 674 | 695 | 723 | 751 | 779 | 827 | 883 | 883 |
| | .06 | \$ 619 | 646 | 674 | 702 | 730 | 751 | 779 | 806 | 834 | 883 | 939 | 939 |
| | .07 | \$ 667 | 695 | 723 | 751 | 779 | 799 | 827 | 855 | 883 | 932 | 987 | 987 |
| | .08 | \$ 716 | 744 | 772 | 799 | 827 | 848 | 876 | 904 | 932 | 980 | 1036 | 1036 |
| | .09 | \$ 765 | 793 | 820 | 848 | 876 | 897 | 925 | 952 | 980 | 1029 | 1085 | 1085 |
| | .10 | \$ 820 | 848 | 876 | 904 | 932 | 952 | 980 | 1008 | 1036 | 1085 | 1140 | 1140 |
| | .12 | \$ 918 | 946 | 973 | 1001 | 1029 | 1050 | 1078 | 1106 | 1133 | 1182 | 1238 | 1238 |
| | .14 | \$ 1022 | 1050 | 1078 | 1106 | 1133 | 1154 | 1182 | 1210 | 1238 | 1286 | 1342 | 1342 |
| | .16 | \$ 1119 | 1147 | 1175 | 1203 | 1231 | 1252 | 1279 | 1307 | 1335 | 1384 | 1439 | 1439 |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 660 | 702 | 737 | 772 | 813 | 848 | 883 | 925 | 959 | 1036 | 1112 | 1112 |
| | .06 | \$ 702 | 744 | 779 | 813 | 855 | 890 | 925 | 966 | 1001 | 1078 | 1154 | 1154 |
| | .07 | \$ 744 | 786 | 820 | 855 | 897 | 932 | 966 | 1008 | 1043 | 1119 | 1196 | 1196 |
| | .08 | \$ 786 | 827 | 862 | 897 | 939 | 973 | 1008 | 1050 | 1085 | 1161 | 1238 | 1238 |
| | .09 | \$ 827 | 869 | 904 | 939 | 980 | 1015 | 1050 | 1092 | 1126 | 1203 | 1279 | 1279 |
| | .10 | \$ 869 | 911 | 946 | 980 | 1022 | 1057 | 1092 | 1133 | 1168 | 1245 | 1321 | 1321 |
| | .12 | \$ 952 | 994 | 1029 | 1064 | 1106 | 1140 | 1175 | 1217 | 1252 | 1328 | 1405 | 1405 |
| | .14 | \$ 1043 | 1085 | 1119 | 1154 | 1196 | 1231 | 1266 | 1307 | 1342 | 1419 | 1495 | 1495 |
| | .16 | \$ 1126 | 1168 | 1203 | 1238 | 1279 | 1314 | 1349 | 1391 | 1426 | 1502 | 1579 | 1579 |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 813 | 862 | 911 | 952 | 1001 | 1050 | 1099 | 1140 | 1189 | 1279 | 1377 | 1377 |
| | .06 | \$ 862 | 911 | 959 | 1001 | 1050 | 1099 | 1147 | 1189 | 1238 | 1328 | 1426 | 1426 |
| | .07 | \$ 918 | 966 | 1015 | 1057 | 1106 | 1154 | 1203 | 1245 | 1293 | 1384 | 1481 | 1481 |
| | .08 | \$ 966 | 1015 | 1064 | 1106 | 1154 | 1203 | 1252 | 1293 | 1342 | 1432 | 1530 | 1530 |
| | .09 | \$ 1015 | 1064 | 1112 | 1154 | 1203 | 1252 | 1300 | 1342 | 1391 | 1481 | 1579 | 1579 |
| | .10 | \$ 1071 | 1119 | 1168 | 1210 | 1259 | 1307 | 1356 | 1398 | 1446 | 1537 | 1634 | 1634 |
| | .12 | \$ 1168 | 1217 | 1266 | 1307 | 1356 | 1405 | 1453 | 1495 | 1544 | 1634 | 1732 | 1732 |
| | .14 | \$ 1272 | 1321 | 1370 | 1412 | 1460 | 1509 | 1558 | 1599 | 1648 | 1739 | 1836 | 1836 |
| | .16 | \$ 1377 | 1426 | 1474 | 1516 | 1565 | 1613 | 1662 | 1704 | 1752 | 1843 | 1940 | 1940 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16
 \$ 49 59 69 79 89 99 118 138 158

--ELECTRIC RATE \$/KWH
 --THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 24UHPQB INDOOR A36AO-A
ARI RATED COOLING CAP.: BTUH(95) 23000 SEER10.50
ARI RATED HEATING CAP.: BTUH (47) 23600 COP(47) 3.10, HSPF 7.50 MIN.DHR REG IV
BTUH (17) 14200, COP(17) 2.10
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH |
|-------------------|-------------------------|
|-------------------|-------------------------|

25,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | | |
|-----|----|------|------|-------------------------|
| .05 | \$ | 417 | 772 | |
| .06 | \$ | 500 | 925 | |
| .07 | \$ | 584 | 1085 | |
| .08 | \$ | 667 | 1238 | |
| .09 | \$ | 758 | 1391 | |
| .10 | \$ | 841 | 1544 | |
| .12 | \$ | 1008 | 1857 | BALANCE POINT 13 DEG.F. |
| .14 | \$ | 1175 | 2170 | |
| .16 | \$ | 1342 | 2476 | |

30,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | | |
|-----|----|------|------|-------------------------|
| .05 | \$ | 507 | 925 | |
| .06 | \$ | 612 | 1112 | |
| .07 | \$ | 716 | 1300 | |
| .08 | \$ | 813 | 1488 | |
| .09 | \$ | 918 | 1669 | |
| .10 | \$ | 1022 | 1857 | |
| .12 | \$ | 1231 | 2232 | BALANCE POINT 18 DEG.F. |
| .14 | \$ | 1432 | 2601 | |
| .16 | \$ | 1634 | 2977 | |

35,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | | |
|-----|----|------|------|-------------------------|
| .05 | \$ | 605 | 1085 | |
| .06 | \$ | 730 | 1300 | |
| .07 | \$ | 848 | 1516 | |
| .08 | \$ | 973 | 1732 | |
| .09 | \$ | 1092 | 1947 | |
| .10 | \$ | 1217 | 2170 | |
| .12 | \$ | 1460 | 2601 | BALANCE POINT 22 DEG.F. |
| .14 | \$ | 1704 | 3039 | |
| .16 | \$ | 1947 | 3471 | |

40,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | | |
|-----|----|------|------|-------------------------|
| .05 | \$ | 709 | 1238 | |
| .06 | \$ | 855 | 1488 | |
| .07 | \$ | 1001 | 1732 | |
| .08 | \$ | 1147 | 1982 | |
| .09 | \$ | 1286 | 2232 | |
| .10 | \$ | 1432 | 2476 | |
| .12 | \$ | 1711 | 2977 | |
| .14 | \$ | 2003 | 3471 | BALANCE POINT 25 DEG.F. |
| .16 | \$ | 2288 | 3965 | |

50,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | | |
|-----|----|------|------|-------------------------|
| .05 | \$ | 946 | 1544 | |
| .06 | \$ | 1133 | 1857 | |
| .07 | \$ | 1321 | 2170 | |
| .08 | \$ | 1509 | 2476 | |
| .09 | \$ | 1697 | 2789 | |
| .10 | \$ | 1885 | 3095 | |
| .12 | \$ | 2260 | 3721 | |
| .14 | \$ | 2643 | 4340 | BALANCE POINT 31 DEG.F. |
| .16 | \$ | 3018 | 4959 | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

\$.05 .06 .07 .08 .09 .10 .12 .14 .16

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 24UHPQB INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 23000 SEER10.50
 ARI RATED HEATING CAP.: BTUH (47) 23600 COP(47) 3.10, EERPF 7.50 MIN.DER REG IV
 BTUH (17) 14200 COP(17) 2.10
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST S/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY | |
|-------------------|------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|---|---|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | |
| 25,000 | \$ 236 | 271 | 299 | 333 | 368 | 403 | 438 | 473 | 507 | 542 | 605 | 674 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 313 | 319 | 333 | 340 | 354 | 361 | 375 | 382 | 396 | 403 | 424 | 445 |
| | .06 | \$ 354 | 361 | 375 | 382 | 396 | 403 | 417 | 424 | 438 | 445 | 466 | 486 |
| | .07 | \$ 403 | 410 | 424 | 431 | 445 | 452 | 466 | 473 | 486 | 493 | 514 | 535 |
| | .08 | \$ 452 | 459 | 473 | 479 | 493 | 500 | 514 | 521 | 535 | 542 | 563 | 584 |
| | .09 | \$ 500 | 507 | 521 | 528 | 542 | 549 | 563 | 570 | 584 | 591 | 612 | 633 |
| | .10 | \$ 542 | 549 | 563 | 570 | 584 | 591 | 605 | 612 | 626 | 633 | 653 | 674 |
| | .12 | \$ 639 | 646 | 660 | 667 | 681 | 688 | 702 | 709 | 723 | 730 | 751 | 772 |
| | .14 | \$ 730 | 737 | 751 | 758 | 772 | 779 | 793 | 799 | 813 | 820 | 841 | 862 |
| | .16 | \$ 827 | 834 | 848 | 855 | 869 | 876 | 890 | 897 | 911 | 918 | 939 | 959 |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 347 | 368 | 382 | 396 | 417 | 431 | 445 | 466 | 479 | 493 | 528 | 556 |
| | .06 | \$ 396 | 417 | 431 | 445 | 466 | 479 | 493 | 514 | 528 | 542 | 577 | 605 |
| | .07 | \$ 445 | 466 | 479 | 493 | 514 | 528 | 542 | 563 | 577 | 591 | 626 | 653 |
| | .08 | \$ 486 | 507 | 521 | 535 | 556 | 570 | 584 | 605 | 619 | 633 | 667 | 695 |
| | .09 | \$ 535 | 556 | 570 | 584 | 605 | 619 | 633 | 653 | 667 | 681 | 716 | 744 |
| | .10 | \$ 584 | 605 | 619 | 633 | 653 | 667 | 681 | 702 | 716 | 730 | 765 | 793 |
| | .12 | \$ 681 | 702 | 716 | 730 | 751 | 765 | 779 | 799 | 813 | 827 | 862 | 890 |
| | .14 | \$ 772 | 793 | 806 | 820 | 841 | 855 | 869 | 890 | 904 | 918 | 952 | 980 |
| | .16 | \$ 869 | 890 | 904 | 918 | 939 | 952 | 966 | 987 | 1001 | 1015 | 1050 | 1078 |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 389 | 417 | 438 | 459 | 486 | 507 | 535 | 556 | 584 | 605 | 653 | 702 |
| | .06 | \$ 431 | 459 | 479 | 500 | 528 | 549 | 577 | 598 | 626 | 646 | 695 | 744 |
| | .07 | \$ 473 | 500 | 521 | 542 | 570 | 591 | 619 | 639 | 667 | 688 | 737 | 786 |
| | .08 | \$ 521 | 549 | 570 | 591 | 619 | 639 | 667 | 688 | 716 | 737 | 786 | 834 |
| | .09 | \$ 563 | 591 | 612 | 633 | 660 | 681 | 709 | 730 | 758 | 779 | 827 | 876 |
| | .10 | \$ 605 | 633 | 653 | 674 | 702 | 723 | 751 | 772 | 799 | 820 | 869 | 918 |
| | .12 | \$ 695 | 723 | 744 | 765 | 793 | 813 | 841 | 862 | 890 | 911 | 959 | 1008 |
| | .14 | \$ 779 | 806 | 827 | 848 | 876 | 897 | 925 | 946 | 973 | 994 | 1043 | 1092 |
| | .16 | \$ 869 | 897 | 918 | 939 | 966 | 987 | 1015 | 1036 | 1064 | 1085 | 1133 | 1182 |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 445 | 466 | 493 | 521 | 549 | 577 | 605 | 633 | 660 | 688 | 744 | 799 |
| | .06 | \$ 493 | 514 | 542 | 570 | 598 | 626 | 653 | 681 | 709 | 737 | 793 | 848 |
| | .07 | \$ 542 | 563 | 591 | 619 | 646 | 674 | 702 | 730 | 758 | 786 | 841 | 897 |
| | .08 | \$ 591 | 612 | 639 | 667 | 695 | 723 | 751 | 779 | 806 | 834 | 890 | 946 |
| | .09 | \$ 639 | 660 | 688 | 716 | 744 | 772 | 799 | 827 | 855 | 883 | 939 | 994 |
| | .10 | \$ 688 | 709 | 737 | 765 | 793 | 820 | 848 | 876 | 904 | 932 | 987 | 1043 |
| | .12 | \$ 793 | 813 | 841 | 869 | 897 | 925 | 952 | 980 | 1008 | 1036 | 1092 | 1147 |
| | .14 | \$ 890 | 911 | 939 | 966 | 994 | 1022 | 1050 | 1078 | 1106 | 1133 | 1189 | 1245 |
| | .16 | \$ 987 | 1008 | 1036 | 1064 | 1092 | 1119 | 1147 | 1175 | 1203 | 1231 | 1286 | 1342 |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 521 | 563 | 605 | 646 | 688 | 730 | 772 | 813 | 855 | 897 | 987 | 1071 |
| | .06 | \$ 570 | 612 | 653 | 695 | 737 | 779 | 820 | 862 | 904 | 946 | 1036 | 1119 |
| | .07 | \$ 612 | 653 | 695 | 737 | 779 | 820 | 862 | 904 | 946 | 987 | 1078 | 1161 |
| | .08 | \$ 660 | 702 | 744 | 786 | 827 | 869 | 911 | 952 | 994 | 1036 | 1126 | 1210 |
| | .09 | \$ 702 | 744 | 786 | 827 | 869 | 911 | 952 | 994 | 1036 | 1078 | 1168 | 1252 |
| | .10 | \$ 751 | 793 | 834 | 876 | 918 | 959 | 1001 | 1043 | 1085 | 1126 | 1217 | 1300 |
| | .12 | \$ 841 | 883 | 925 | 966 | 1008 | 1050 | 1092 | 1133 | 1175 | 1217 | 1307 | 1391 |
| | .14 | \$ 925 | 966 | 1008 | 1050 | 1092 | 1133 | 1175 | 1217 | 1259 | 1300 | 1391 | 1474 |
| | .16 | \$ 1015 | 1057 | 1099 | 1140 | 1182 | 1224 | 1266 | 1307 | 1349 | 1391 | 1481 | 1565 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

S .05 .06 .07 .08 .09 .10 .12 .14 .16

--ELECTRIC RATE S/KWH
--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 24UHPOB/A36AO-A
 BTU/PUMP MODEL: OUTDOOR 24UHPOB INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 23000 SEER10.50
 ARI RATED HEATING CAP.: BTUH (47) 23600 COP(47) 3.10, ESSPF 7.50 MIN.DHR REG IV
 BTUH (17) 14200, COP(17) 2.10
 FURNACE TYPE FURN. OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | |
|----------------|-------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|---|--|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | | |
| 25,000 | \$ 340 | 389 | 438 | 486 | 535 | 584 | 633 | 681 | 730 | 779 | 827 | 876 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 340 | 354 | 368 | 389 | 403 | 417 | 431 | 445 | 459 | 479 | 493 | 507 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 382 | 396 | 410 | 431 | 445 | 459 | 473 | 486 | 500 | 521 | 535 | 549 | | |
| | .07 | \$ 431 | 445 | 459 | 479 | 493 | 507 | 521 | 535 | 549 | 570 | 584 | 598 | | |
| | .08 | \$ 479 | 493 | 507 | 528 | 542 | 556 | 570 | 584 | 598 | 619 | 633 | 646 | | |
| | .09 | \$ 528 | 542 | 556 | 577 | 591 | 605 | 619 | 633 | 646 | 667 | 681 | 695 | | |
| | .10 | \$ 570 | 584 | 598 | 619 | 633 | 646 | 660 | 674 | 688 | 709 | 723 | 737 | | |
| | .12 | \$ 667 | 681 | 695 | 716 | 730 | 744 | 758 | 772 | 786 | 806 | 820 | 834 | | |
| | .14 | \$ 758 | 772 | 786 | 806 | 820 | 834 | 848 | 862 | 876 | 897 | 911 | 925 | | |
| | .16 | \$ 855 | 869 | 883 | 904 | 918 | 932 | 946 | 959 | 973 | 994 | 1008 | 1022 | BALANCE POINT 13 DEG.F. | |
| 30,000 | \$ 410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 396 | 424 | 445 | 466 | 493 | 514 | 542 | 563 | 584 | 612 | 633 | 653 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 445 | 473 | 493 | 514 | 542 | 563 | 591 | 612 | 633 | 660 | 681 | 702 | | |
| | .07 | \$ 493 | 521 | 542 | 563 | 591 | 612 | 639 | 660 | 681 | 709 | 730 | 751 | | |
| | .08 | \$ 535 | 563 | 584 | 605 | 633 | 653 | 681 | 702 | 723 | 751 | 772 | 793 | | |
| | .09 | \$ 584 | 612 | 633 | 653 | 681 | 702 | 730 | 751 | 772 | 799 | 820 | 841 | | |
| | .10 | \$ 633 | 660 | 681 | 702 | 730 | 751 | 779 | 799 | 820 | 848 | 869 | 890 | | |
| | .12 | \$ 730 | 758 | 779 | 799 | 827 | 848 | 876 | 897 | 918 | 946 | 966 | 987 | | |
| | .14 | \$ 820 | 848 | 869 | 890 | 918 | 939 | 966 | 987 | 1008 | 1036 | 1057 | 1078 | | |
| | .16 | \$ 918 | 946 | 966 | 987 | 1015 | 1036 | 1064 | 1085 | 1106 | 1133 | 1154 | 1175 | BALANCE POINT 18 DEG.F. | |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 466 | 500 | 535 | 570 | 605 | 639 | 674 | 702 | 737 | 772 | 806 | 841 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 507 | 542 | 577 | 612 | 646 | 681 | 716 | 744 | 779 | 813 | 848 | 883 | | |
| | .07 | \$ 549 | 584 | 619 | 653 | 688 | 723 | 758 | 786 | 820 | 855 | 890 | 925 | | |
| | .08 | \$ 598 | 633 | 667 | 702 | 737 | 772 | 806 | 834 | 869 | 904 | 939 | 973 | | |
| | .09 | \$ 639 | 674 | 709 | 744 | 779 | 813 | 848 | 876 | 911 | 946 | 980 | 1015 | | |
| | .10 | \$ 681 | 716 | 751 | 786 | 820 | 855 | 890 | 918 | 952 | 987 | 1022 | 1057 | | |
| | .12 | \$ 772 | 806 | 841 | 876 | 911 | 946 | 980 | 1008 | 1043 | 1078 | 1112 | 1147 | | |
| | .14 | \$ 855 | 890 | 925 | 959 | 994 | 1029 | 1064 | 1092 | 1126 | 1161 | 1196 | 1231 | | |
| | .16 | \$ 946 | 980 | 1015 | 1050 | 1085 | 1119 | 1154 | 1182 | 1217 | 1252 | 1286 | 1321 | BALANCE POINT 22 DEG.F. | |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 528 | 563 | 605 | 646 | 681 | 723 | 765 | 799 | 841 | 883 | 918 | 959 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 577 | 612 | 653 | 695 | 730 | 772 | 813 | 848 | 880 | 932 | 966 | 1008 | | |
| | .07 | \$ 626 | 660 | 702 | 744 | 779 | 820 | 862 | 897 | 939 | 980 | 1015 | 1057 | | |
| | .08 | \$ 674 | 709 | 751 | 793 | 827 | 869 | 911 | 946 | 987 | 1029 | 1064 | 1106 | | |
| | .09 | \$ 723 | 758 | 799 | 841 | 876 | 918 | 959 | 994 | 1036 | 1078 | 1112 | 1154 | | |
| | .10 | \$ 772 | 806 | 848 | 890 | 925 | 966 | 1008 | 1043 | 1085 | 1126 | 1161 | 1203 | | |
| | .12 | \$ 876 | 911 | 952 | 994 | 1029 | 1071 | 1112 | 1147 | 1189 | 1231 | 1266 | 1307 | | |
| | .14 | \$ 973 | 1008 | 1050 | 1092 | 1126 | 1168 | 1210 | 1245 | 1286 | 1328 | 1363 | 1405 | | |
| | .16 | \$ 1071 | 1106 | 1147 | 1189 | 1224 | 1266 | 1307 | 1342 | 1384 | 1426 | 1460 | 1502 | BALANCE POINT 25 DEG.F. | |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 646 | 709 | 772 | 834 | 897 | 952 | 1015 | 1078 | 1140 | 1203 | 1259 | 1321 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 695 | 758 | 820 | 883 | 946 | 1001 | 1064 | 1126 | 1189 | 1252 | 1307 | 1370 | | |
| | .07 | \$ 737 | 799 | 862 | 925 | 987 | 1043 | 1106 | 1168 | 1231 | 1293 | 1349 | 1412 | | |
| | .08 | \$ 786 | 848 | 911 | 973 | 1036 | 1092 | 1154 | 1217 | 1279 | 1342 | 1398 | 1460 | | |
| | .09 | \$ 827 | 890 | 952 | 1015 | 1078 | 1133 | 1196 | 1259 | 1321 | 1384 | 1439 | 1502 | | |
| | .10 | \$ 876 | 939 | 1001 | 1064 | 1126 | 1182 | 1245 | 1307 | 1370 | 1432 | 1488 | 1551 | | |
| | .12 | \$ 966 | 1029 | 1092 | 1154 | 1217 | 1272 | 1335 | 1398 | 1460 | 1523 | 1579 | 1641 | | |
| | .14 | \$ 1050 | 1112 | 1175 | 1238 | 1300 | 1356 | 1419 | 1481 | 1544 | 1606 | 1662 | 1725 | | |
| | .16 | \$ 1140 | 1203 | 1266 | 1328 | 1391 | 1446 | 1509 | 1572 | 1634 | 1697 | 1752 | 1815 | BALANCE POINT 31 DEG.F. | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | |
|-------|-----|-----|-----|-----|-----|------|------|------|
| s .05 | .52 | .61 | .70 | .78 | .87 | .105 | .122 | .140 |
|-------|-----|-----|-----|-----|-----|------|------|------|

| | |
|-------------------------|--------------------------------------|
| <--ELECTRIC RATE \$/KWH | <--THEORETICAL AIR CONDITIONING COST |
|-------------------------|--------------------------------------|

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 24UHPQB/A36AO-A
 HEAT PUMP MODEL: OUTDOOR 24UHPQB INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 23000, SEER10.50
 ARI RATED HEATING CAP.: BTUH (47) 23600, COP(47) 3.10, EERPF 7.50 MIN.DER REG IV
 BTUH (17) 14200, COP(17) 2.10
 FURNACE TYPE: PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
| 25,000 | \$ 445 | 479 | 521 | 556 | 591 | 633 | 667 | 702 | 744 | 813 | 890 | 890 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 375 | 382 | 396 | 410 | 417 | 431 | 445 | 452 | 466 | 486 | 514 | 514 |
| | .06 | \$ 417 | 424 | 438 | 452 | 459 | 473 | 486 | 493 | 507 | 528 | 556 | 556 |
| | .07 | \$ 466 | 473 | 486 | 500 | 507 | 521 | 535 | 542 | 556 | 577 | 605 | 605 |
| | .08 | \$ 514 | 521 | 535 | 549 | 556 | 570 | 584 | 591 | 605 | 626 | 653 | 653 |
| | .09 | \$ 563 | 570 | 584 | 598 | 605 | 619 | 633 | 639 | 653 | 674 | 702 | 702 |
| | .10 | \$ 605 | 612 | 626 | 639 | 646 | 660 | 674 | 681 | 695 | 716 | 744 | 744 |
| | .12 | \$ 702 | 709 | 723 | 737 | 744 | 758 | 772 | 779 | 793 | 813 | 841 | 841 |
| | .14 | \$ 793 | 799 | 813 | 827 | 834 | 848 | 862 | 869 | 883 | 904 | 932 | 932 |
| | .16 | \$ 890 | 897 | 911 | 925 | 932 | 946 | 959 | 966 | 980 | 1001 | 1029 | 1029 |
| | | | | | | | | | | | | | BALANCE POINT 13 DEG.F. |
| 30,000 | \$ 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 452 | 466 | 486 | 500 | 521 | 535 | 556 | 570 | 591 | 626 | 660 | 660 |
| | .06 | \$ 500 | 514 | 535 | 549 | 570 | 584 | 605 | 619 | 639 | 674 | 709 | 709 |
| | .07 | \$ 549 | 563 | 584 | 598 | 619 | 633 | 653 | 667 | 688 | 723 | 758 | 758 |
| | .08 | \$ 591 | 605 | 626 | 639 | 660 | 674 | 695 | 709 | 730 | 765 | 799 | 799 |
| | .09 | \$ 639 | 653 | 674 | 688 | 709 | 723 | 744 | 758 | 779 | 813 | 848 | 848 |
| | .10 | \$ 688 | 702 | 723 | 737 | 758 | 772 | 793 | 806 | 827 | 862 | 897 | 897 |
| | .12 | \$ 786 | 799 | 820 | 834 | 855 | 869 | 890 | 904 | 925 | 959 | 994 | 994 |
| | .14 | \$ 876 | 890 | 911 | 925 | 946 | 959 | 980 | 994 | 1015 | 1050 | 1085 | 1085 |
| | .16 | \$ 973 | 987 | 1008 | 1022 | 1043 | 1057 | 1078 | 1092 | 1112 | 1147 | 1182 | 1182 |
| | | | | | | | | | | | | | BALANCE POINT 18 DEG.F. |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 535 | 563 | 591 | 619 | 646 | 667 | 695 | 723 | 751 | 799 | 855 | 855 |
| | .06 | \$ 577 | 605 | 633 | 660 | 688 | 709 | 731 | 765 | 793 | 841 | 897 | 897 |
| | .07 | \$ 619 | 646 | 674 | 702 | 730 | 751 | 779 | 806 | 834 | 883 | 939 | 939 |
| | .08 | \$ 667 | 695 | 723 | 751 | 779 | 799 | 827 | 855 | 883 | 932 | 987 | 987 |
| | .09 | \$ 709 | 737 | 765 | 793 | 820 | 841 | 869 | 897 | 925 | 973 | 1029 | 1029 |
| | .10 | \$ 751 | 779 | 806 | 834 | 862 | 883 | 911 | 939 | 966 | 1015 | 1071 | 1071 |
| | .12 | \$ 841 | 869 | 897 | 925 | 952 | 973 | 1001 | 1029 | 1057 | 1106 | 1161 | 1161 |
| | .14 | \$ 925 | 952 | 980 | 1008 | 1036 | 1057 | 1085 | 1112 | 1140 | 1189 | 1245 | 1245 |
| | .16 | \$ 1015 | 1043 | 1071 | 1099 | 1126 | 1147 | 1175 | 1203 | 1231 | 1279 | 1335 | 1335 |
| | | | | | | | | | | | | | BALANCE POINT 22 DEG.F. |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 612 | 639 | 674 | 702 | 730 | 758 | 793 | 820 | 848 | 911 | 973 | 973 |
| | .06 | \$ 660 | 688 | 723 | 751 | 779 | 806 | 841 | 869 | 897 | 959 | 1022 | 1022 |
| | .07 | \$ 709 | 737 | 772 | 799 | 827 | 855 | 890 | 918 | 946 | 1008 | 1071 | 1071 |
| | .08 | \$ 758 | 786 | 820 | 848 | 876 | 904 | 939 | 966 | 994 | 1057 | 1119 | 1119 |
| | .09 | \$ 806 | 834 | 869 | 897 | 925 | 952 | 987 | 1015 | 1043 | 1106 | 1168 | 1168 |
| | .10 | \$ 855 | 883 | 918 | 946 | 973 | 1001 | 1036 | 1064 | 1092 | 1154 | 1217 | 1217 |
| | .12 | \$ 959 | 987 | 1022 | 1050 | 1078 | 1106 | 1140 | 1168 | 1196 | 1259 | 1321 | 1321 |
| | .14 | \$ 1057 | 1085 | 1119 | 1147 | 1175 | 1203 | 1238 | 1266 | 1293 | 1356 | 1419 | 1419 |
| | .16 | \$ 1154 | 1182 | 1217 | 1245 | 1272 | 1300 | 1335 | 1363 | 1391 | 1453 | 1516 | 1516 |
| | | | | | | | | | | | | | BALANCE POINT 25 DEG.F. |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 779 | 827 | 876 | 918 | 966 | 1015 | 1064 | 1106 | 1154 | 1245 | 1342 | 1342 |
| | .06 | \$ 827 | 876 | 925 | 966 | 1015 | 1064 | 1112 | 1154 | 1203 | 1293 | 1391 | 1391 |
| | .07 | \$ 869 | 918 | 966 | 1008 | 1057 | 1106 | 1154 | 1196 | 1245 | 1335 | 1432 | 1432 |
| | .08 | \$ 918 | 966 | 1015 | 1057 | 1106 | 1154 | 1203 | 1245 | 1293 | 1384 | 1481 | 1481 |
| | .09 | \$ 959 | 1008 | 1057 | 1099 | 1147 | 1196 | 1245 | 1286 | 1335 | 1426 | 1523 | 1523 |
| | .10 | \$ 1008 | 1057 | 1106 | 1147 | 1196 | 1245 | 1293 | 1335 | 1384 | 1474 | 1572 | 1572 |
| | .12 | \$ 1099 | 1147 | 1196 | 1238 | 1286 | 1335 | 1384 | 1426 | 1474 | 1565 | 1662 | 1662 |
| | .14 | \$ 1182 | 1231 | 1279 | 1321 | 1370 | 1419 | 1467 | 1509 | 1558 | 1648 | 1745 | 1745 |
| | .16 | \$ 1272 | 1321 | 1370 | 1412 | 1460 | 1509 | 1558 | 1599 | 1648 | 1739 | 1836 | 1836 |
| | | | | | | | | | | | | | BALANCE POINT 31 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
 43 52 61 70 78 87 105 122 140

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 28200 SEER 9.19
 ARI RATED HEATING CAP.: BTUH (47) 29800 COP(47) 3.00 HSPF 6.90 MIN.DHR REG IV
 BTUH (17) 16400 COP(17) 2.10 FURNACE EFFICIENCY 100.00 % AFUE
 FURNACE TYPE ELECTRIC

HEAT LOSS
BTUH ELEC. COST
S/KWH

35,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 626 | 1085 |
| .06 | S | 751 | 1300 |
| .07 | S | 876 | 1516 |
| .08 | S | 1001 | 1732 |
| .09 | S | 1126 | 1947 |
| .10 | S | 1251 | 2170 |
| .12 | S | 1502 | 2601 |
| .14 | S | 1752 | 3039 |
| .16 | S | 2003 | 3471 |

BALANCE POINT 18 DEG.F.

40,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 723 | 1238 |
| .06 | S | 869 | 1488 |
| .07 | S | 1008 | 1732 |
| .08 | S | 1154 | 1982 |
| .09 | S | 1307 | 2232 |
| .10 | S | 1446 | 2476 |
| .12 | S | 1732 | 2977 |
| .14 | S | 2031 | 3471 |
| .16 | S | 2316 | 3965 |

BALANCE POINT 21 DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 939 | 1544 |
| .06 | S | 1126 | 1857 |
| .07 | S | 1314 | 2170 |
| .08 | S | 1495 | 2476 |
| .09 | S | 1683 | 2789 |
| .10 | S | 1871 | 3095 |
| .12 | S | 2253 | 3721 |
| .14 | S | 2622 | 4340 |
| .16 | S | 2998 | 4959 |

BALANCE POINT 27 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1175 | 1857 |
| .06 | S | 1405 | 2232 |
| .07 | S | 1641 | 2601 |
| .08 | S | 1878 | 2977 |
| .09 | S | 2107 | 3345 |
| .10 | S | 2344 | 3721 |
| .12 | S | 2810 | 4465 |
| .14 | S | 3283 | 5210 |
| .16 | S | 3749 | 5954 |

BALANCE POINT 31 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1426 | 2170 |
| .06 | S | 1711 | 2601 |
| .07 | S | 1996 | 3039 |
| .08 | S | 2281 | 3471 |
| .09 | S | 2566 | 3902 |
| .10 | S | 2852 | 4340 |
| .12 | S | 3422 | 5210 |
| .14 | S | 3992 | 6079 |
| .16 | S | 4570 | 6942 |

BALANCE POINT 34 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
| S | 61 | 73 | 85 | 98 | 110 | 122 | 147 | 171 | 196 |

--> ELECTRIC RATE S/KWH
 --> THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL-FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 30UEHPOA/A36AO-A
 HEAT PUMP MODEL: OUTDOOR 30UEHPOA INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 28200 SEER 9.19
 ARI RATED HEATING CAP.: BTUH (47) 29300 COP(47) 3.00, ESEPF 6.90 MIN.DHR REG IV
 BTUH (17) 16400 COP(17) 2.10
 FURNAC TYPK NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 396 | 403 | 417 | 431 | 445 | 459 | 466 | 479 | 493 | 507 | 528 | 556 |
| | .06 | \$ 452 | 459 | 473 | 486 | 500 | 514 | 521 | 535 | 549 | 563 | 584 | 612 |
| | .07 | \$ 514 | 521 | 535 | 549 | 563 | 577 | 584 | 598 | 612 | 626 | 646 | 674 |
| | .08 | \$ 577 | 584 | 598 | 612 | 626 | 639 | 646 | 660 | 674 | 688 | 709 | 737 |
| | .09 | \$ 633 | 639 | 653 | 667 | 681 | 695 | 702 | 716 | 730 | 744 | 765 | 793 |
| | .10 | \$ 695 | 702 | 716 | 730 | 744 | 758 | 765 | 779 | 793 | 806 | 827 | 855 |
| | .12 | \$ 820 | 827 | 841 | 855 | 869 | 883 | 890 | 904 | 918 | 932 | 952 | 980 |
| | .14 | \$ 939 | 946 | 959 | 973 | 987 | 1001 | 1008 | 1022 | 1036 | 1050 | 1071 | 1099 |
| | .16 | \$ 1057 | 1064 | 1078 | 1092 | 1106 | 1119 | 1126 | 1140 | 1154 | 1168 | 1189 | 1217 |
| | | | | | | | | | | | | | BALANCE POINT 14 DEG.F. |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 431 | 452 | 466 | 486 | 507 | 528 | 542 | 563 | 584 | 598 | 639 | 674 |
| | .06 | \$ 493 | 514 | 528 | 549 | 570 | 591 | 605 | 626 | 646 | 660 | 702 | 737 |
| | .07 | \$ 549 | 570 | 584 | 605 | 626 | 646 | 660 | 681 | 702 | 716 | 758 | 793 |
| | .08 | \$ 612 | 633 | 646 | 667 | 688 | 709 | 723 | 744 | 765 | 779 | 820 | 855 |
| | .09 | \$ 674 | 695 | 709 | 730 | 751 | 772 | 788 | 806 | 827 | 841 | 883 | 918 |
| | .10 | \$ 730 | 751 | 765 | 786 | 806 | 827 | 841 | 862 | 883 | 897 | 939 | 973 |
| | .12 | \$ 848 | 869 | 883 | 904 | 925 | 946 | 959 | 980 | 1001 | 1015 | 1057 | 1092 |
| | .14 | \$ 973 | 994 | 1008 | 1029 | 1050 | 1071 | 1085 | 1106 | 1126 | 1140 | 1182 | 1217 |
| | .16 | \$ 1092 | 1112 | 1126 | 1147 | 1168 | 1189 | 1203 | 1224 | 1245 | 1259 | 1300 | 1335 |
| | | | | | | | | | | | | | BALANCE POINT 18 DEG.F. |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 486 | 507 | 528 | 549 | 570 | 591 | 612 | 633 | 653 | 681 | 723 | 765 |
| | .06 | \$ 556 | 577 | 598 | 619 | 639 | 660 | 681 | 702 | 723 | 751 | 793 | 834 |
| | .07 | \$ 626 | 646 | 667 | 688 | 709 | 730 | 751 | 772 | 793 | 820 | 862 | 904 |
| | .08 | \$ 688 | 709 | 730 | 751 | 772 | 793 | 813 | 834 | 855 | 883 | 925 | 966 |
| | .09 | \$ 758 | 779 | 799 | 820 | 841 | 862 | 883 | 904 | 925 | 952 | 994 | 1036 |
| | .10 | \$ 820 | 841 | 862 | 883 | 904 | 925 | 946 | 966 | 987 | 1015 | 1057 | 1099 |
| | .12 | \$ 959 | 980 | 1001 | 1022 | 1043 | 1064 | 1085 | 1106 | 1126 | 1154 | 1196 | 1238 |
| | .14 | \$ 1092 | 1112 | 1133 | 1154 | 1175 | 1196 | 1217 | 1238 | 1259 | 1286 | 1328 | 1370 |
| | .16 | \$ 1224 | 1245 | 1266 | 1286 | 1307 | 1328 | 1349 | 1370 | 1391 | 1419 | 1460 | 1502 |
| | | | | | | | | | | | | | BALANCE POINT 21 DEG.F. |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 549 | 591 | 633 | 674 | 716 | 758 | 799 | 841 | 883 | 925 | 1015 | 1099 |
| | .06 | \$ 598 | 639 | 681 | 723 | 765 | 806 | 848 | 890 | 932 | 973 | 1064 | 1147 |
| | .07 | \$ 646 | 688 | 730 | 772 | 813 | 855 | 897 | 939 | 980 | 1022 | 1112 | 1196 |
| | .08 | \$ 702 | 744 | 786 | 827 | 869 | 911 | 952 | 994 | 1036 | 1078 | 1168 | 1252 |
| | .09 | \$ 751 | 793 | 834 | 876 | 918 | 959 | 1001 | 1043 | 1085 | 1126 | 1217 | 1300 |
| | .10 | \$ 799 | 841 | 883 | 925 | 966 | 1008 | 1050 | 1092 | 1133 | 1175 | 1266 | 1349 |
| | .12 | \$ 897 | 939 | 980 | 1022 | 1064 | 1106 | 1147 | 1189 | 1231 | 1272 | 1363 | 1446 |
| | .14 | \$ 1001 | 1043 | 1085 | 1126 | 1168 | 1210 | 1252 | 1293 | 1335 | 1377 | 1467 | 1551 |
| | .16 | \$ 1099 | 1140 | 1182 | 1224 | 1266 | 1307 | 1349 | 1391 | 1432 | 1474 | 1565 | 1648 |
| | | | | | | | | | | | | | BALANCE POINT 27 DEG.F. |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 646 | 695 | 751 | 799 | 848 | 904 | 952 | 1001 | 1057 | 1106 | 1210 | 1307 |
| | .06 | \$ 702 | 751 | 806 | 855 | 904 | 959 | 1008 | 1057 | 1112 | 1161 | 1266 | 1363 |
| | .07 | \$ 765 | 813 | 869 | 918 | 966 | 1022 | 1071 | 1119 | 1175 | 1224 | 1328 | 1426 |
| | .08 | \$ 820 | 869 | 925 | 973 | 1022 | 1078 | 1126 | 1175 | 1231 | 1279 | 1384 | 1481 |
| | .09 | \$ 876 | 925 | 980 | 1029 | 1078 | 1133 | 1182 | 1231 | 1286 | 1335 | 1439 | 1537 |
| | .10 | \$ 939 | 987 | 1043 | 1092 | 1140 | 1196 | 1245 | 1293 | 1349 | 1398 | 1502 | 1599 |
| | .12 | \$ 1057 | 1106 | 1161 | 1210 | 1259 | 1314 | 1363 | 1412 | 1467 | 1516 | 1620 | 1718 |
| | .14 | \$ 1168 | 1217 | 1272 | 1321 | 1370 | 1426 | 1474 | 1523 | 1579 | 1627 | 1732 | 1829 |
| | .16 | \$ 1286 | 1335 | 1391 | 1439 | 1488 | 1544 | 1592 | 1641 | 1697 | 1745 | 1850 | 1947 |
| | | | | | | | | | | | | | BALANCE POINT 31 DEG.F. |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 743 | 793 | 862 | 932 | 1001 | 1071 | 1140 | 1210 | 1279 | 1349 | 1488 | 1634 |
| | .06 | \$ 772 | 841 | 911 | 980 | 1050 | 1119 | 1189 | 1259 | 1328 | 1398 | 1537 | 1683 |
| | .07 | \$ 813 | 883 | 952 | 1022 | 1092 | 1161 | 1231 | 1300 | 1370 | 1439 | 1579 | 1725 |
| | .08 | \$ 862 | 932 | 1001 | 1071 | 1140 | 1210 | 1279 | 1349 | 1419 | 1488 | 1667 | 1773 |
| | .09 | \$ 911 | 980 | 1050 | 1119 | 1189 | 1259 | 1328 | 1398 | 1467 | 1537 | 1676 | 1822 |
| | .10 | \$ 952 | 1022 | 1092 | 1161 | 1231 | 1300 | 1370 | 1439 | 1509 | 1579 | 1718 | 1864 |
| | .12 | \$ 1050 | 1119 | 1189 | 1259 | 1328 | 1398 | 1467 | 1537 | 1606 | 1676 | 1815 | 1961 |
| | .14 | \$ 1140 | 1210 | 1279 | 1349 | 1419 | 1488 | 1558 | 1627 | 1697 | 1766 | 1905 | 2052 |
| | .16 | \$ 1231 | 1300 | 1370 | 1439 | 1509 | 1579 | 1648 | 1718 | 1787 | 1857 | 1996 | 2142 |
| | | | | | | | | | | | | | BALANCE POINT 34 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 30URPOA INDOOR A36AO-A
ARI RATED COOLING CAP.: BTUH(95) 28200 SEER 9.19
ARI RATED HEATING CAP.: BTUH (47) 29800 COP(47) 3.00, EERPF 6.90 MIN.DHR REG IV
BTUH (17) 16400 COP(17) 2.10
FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | THEORETICAL HEATING COST * FURNACE ONLY |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|---|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | |
| 30,000 | \$ 410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 431 | 452 | 466 | 486 | 507 | 521 | 542 | 556 | 577 | 598 | 612 | 633 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | |
| .06 | \$ 486 | 507 | 521 | 542 | 563 | 577 | 598 | 612 | 633 | 653 | 667 | 688 | | |
| .07 | \$ 549 | 570 | 584 | 605 | 626 | 639 | 660 | 674 | 695 | 716 | 730 | 751 | | |
| .08 | \$ 613 | 633 | 646 | 667 | 688 | 702 | 723 | 737 | 758 | 779 | 793 | 813 | | |
| .09 | \$ 667 | 688 | 702 | 723 | 744 | 758 | 779 | 793 | 813 | 834 | 848 | 869 | | |
| .10 | \$ 730 | 751 | 765 | 786 | 806 | 820 | 841 | 855 | 876 | 897 | 911 | 932 | | |
| .12 | \$ 855 | 876 | 890 | 911 | 932 | 946 | 966 | 980 | 1001 | 1022 | 1036 | 1057 | | |
| .14 | \$ 973 | 994 | 1008 | 1029 | 1050 | 1064 | 1085 | 1099 | 1119 | 1140 | 1154 | 1175 | | |
| .16 | \$ 1092 | 1112 | 1126 | 1147 | 1168 | 1182 | 1203 | 1217 | 1238 | 1259 | 1272 | 1293 | BALANCE POINT 14 DEG.F. | |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 486 | 514 | 542 | 570 | 598 | 626 | 653 | 681 | 709 | 730 | 758 | 786 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | |
| .06 | \$ 549 | 577 | 605 | 633 | 660 | 688 | 716 | 744 | 772 | 793 | 820 | 848 | | |
| .07 | \$ 605 | 633 | 660 | 688 | 718 | 744 | 772 | 799 | 827 | 848 | 876 | 904 | | |
| .08 | \$ 667 | 695 | 723 | 751 | 779 | 806 | 834 | 862 | 890 | 911 | 939 | 966 | | |
| .09 | \$ 730 | 758 | 786 | 813 | 841 | 869 | 897 | 925 | 952 | 973 | 1001 | 1029 | | |
| .10 | \$ 786 | 813 | 841 | 869 | 897 | 925 | 952 | 980 | 1008 | 1029 | 1057 | 1085 | | |
| .12 | \$ 904 | 932 | 959 | 987 | 1015 | 1043 | 1071 | 1099 | 1126 | 1147 | 1175 | 1203 | | |
| .14 | \$ 1029 | 1057 | 1085 | 1112 | 1140 | 1168 | 1196 | 1224 | 1252 | 1272 | 1300 | 1328 | | |
| .16 | \$ 1147 | 1175 | 1203 | 1231 | 1259 | 1286 | 1314 | 1342 | 1370 | 1391 | 1419 | 1446 | BALANCE POINT 18 DEG.F. | |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 549 | 584 | 612 | 646 | 674 | 709 | 737 | 765 | 799 | 827 | 862 | 890 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | |
| .06 | \$ 619 | 653 | 681 | 716 | 744 | 779 | 806 | 834 | 869 | 897 | 932 | 959 | | |
| .07 | \$ 688 | 723 | 751 | 786 | 813 | 848 | 876 | 904 | 939 | 966 | 1001 | 1029 | | |
| .08 | \$ 751 | 786 | 813 | 848 | 876 | 911 | 939 | 966 | 1001 | 1029 | 1064 | 1092 | | |
| .09 | \$ 820 | 855 | 883 | 918 | 946 | 980 | 1008 | 1036 | 1071 | 1099 | 1133 | 1161 | | |
| .10 | \$ 883 | 918 | 946 | 980 | 1008 | 1043 | 1071 | 1099 | 1133 | 1161 | 1196 | 1224 | | |
| .12 | \$ 1022 | 1057 | 1085 | 1119 | 1147 | 1182 | 1210 | 1238 | 1272 | 1300 | 1335 | 1363 | | |
| .14 | \$ 1154 | 1189 | 1217 | 1252 | 1279 | 1314 | 1342 | 1370 | 1405 | 1432 | 1467 | 1495 | | |
| .16 | \$ 1286 | 1321 | 1349 | 1384 | 1412 | 1446 | 1474 | 1502 | 1537 | 1565 | 1599 | 1627 | BALANCE POINT 21 DEG.F. | |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 674 | 737 | 799 | 862 | 925 | 980 | 1043 | 1106 | 1168 | 1231 | 1286 | 1349 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | |
| .06 | \$ 723 | 786 | 848 | 911 | 973 | 1029 | 1092 | 1154 | 1217 | 1279 | 1335 | 1398 | | |
| .07 | \$ 774 | 834 | 892 | 959 | 1024 | 1078 | 1140 | 1203 | 1266 | 1328 | 1384 | 1446 | | |
| .08 | \$ 827 | 890 | 1015 | 1078 | 1133 | 1196 | 1259 | 1321 | 1384 | 1439 | 1502 | | | |
| .09 | \$ 876 | 939 | 1001 | 1064 | 1126 | 1182 | 1245 | 1307 | 1370 | 1432 | 1488 | 1551 | | |
| .10 | \$ 925 | 987 | 1050 | 1112 | 1175 | 1231 | 1293 | 1356 | 1419 | 1481 | 1537 | 1599 | | |
| .12 | \$ 1022 | 1085 | 1147 | 1210 | 1272 | 1328 | 1391 | 1453 | 1516 | 1579 | 1634 | 1697 | | |
| .14 | \$ 1126 | 1189 | 1252 | 1314 | 1377 | 1432 | 1495 | 1558 | 1620 | 1683 | 1739 | 1801 | | |
| .16 | \$ 1224 | 1286 | 1349 | 1412 | 1474 | 1530 | 1592 | 1655 | 1718 | 1780 | 1836 | 1899 | BALANCE POINT 27 DEG.F. | |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 806 | 876 | 952 | 1022 | 1099 | 1175 | 1245 | 1321 | 1391 | 1467 | 1537 | 1613 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | |
| .06 | \$ 862 | 932 | 1008 | 1078 | 1154 | 1231 | 1300 | 1377 | 1446 | 1523 | 1592 | 1669 | | |
| .07 | \$ 925 | 994 | 1078 | 1140 | 1211 | 1293 | 1363 | 1439 | 1509 | 1586 | 1655 | 1732 | | |
| .08 | \$ 980 | 1050 | 1126 | 1196 | 1272 | 1349 | 1419 | 1495 | 1565 | 1641 | 1711 | 1787 | | |
| .09 | \$ 1036 | 1106 | 1182 | 1252 | 1328 | 1405 | 1474 | 1551 | 1620 | 1697 | 1766 | 1843 | | |
| .10 | \$ 1099 | 1168 | 1245 | 1314 | 1391 | 1467 | 1537 | 1613 | 1683 | 1759 | 1829 | 1905 | | |
| .12 | \$ 1217 | 1286 | 1363 | 1432 | 1509 | 1584 | 1655 | 1732 | 1801 | 1878 | 1947 | 2024 | | |
| .14 | \$ 1328 | 1398 | 1474 | 1544 | 1620 | 1697 | 1766 | 1843 | 1912 | 1989 | 2059 | 2135 | | |
| .16 | \$ 1446 | 1516 | 1592 | 1662 | 1739 | 1815 | 1885 | 1961 | 2031 | 2101 | 2171 | 2253 | BALANCE POINT 31 DEG.F. | |
| 70,000 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 939 | 1036 | 1140 | 1238 | 1342 | 1439 | 1544 | 1641 | 1745 | 1850 | 1947 | 2052 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | |
| .06 | \$ 987 | 1085 | 1189 | 1286 | 1391 | 1488 | 1592 | 1690 | 1794 | 1899 | 1996 | 2100 | | |
| .07 | \$ 1029 | 1126 | 1231 | 1328 | 1432 | 1530 | 1634 | 1732 | 1836 | 1940 | 2038 | 2142 | | |
| .08 | \$ 1078 | 1175 | 1279 | 1377 | 1481 | 1579 | 1683 | 1780 | 1885 | 1989 | 2086 | 2191 | | |
| .09 | \$ 1126 | 1224 | 1328 | 1426 | 1530 | 1627 | 1732 | 1829 | 1933 | 2038 | 2135 | 2239 | | |
| .10 | \$ 1168 | 1266 | 1370 | 1467 | 1572 | 1669 | 1773 | 1871 | 1975 | 2079 | 2177 | 2281 | | |
| .12 | \$ 1266 | 1363 | 1467 | 1565 | 1669 | 1766 | 1871 | 1968 | 2072 | 2177 | 2274 | 2379 | | |
| .14 | \$ 1356 | 1453 | 1558 | 1655 | 1759 | 1857 | 1961 | 2059 | 2163 | 2267 | 2365 | 2469 | | |
| .16 | \$ 1446 | 1544 | 1648 | 1745 | 1850 | 1947 | 2052 | 2149 | 2253 | 2358 | 2455 | 2559 | BALANCE POINT 34 DEG.F. | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16 --ELECTRIC RATE \$/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| REGION 5 | | 30UHPOA/A36AO-A | | | | | | | | | | | |
|---|-------------------------|---------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A36AO-A | | | | | | | | | | | | | |
| ARI RATED COOLING CAP.: BTUH(95) 28200 SEER 9.19 | | | | | | | | | | | | | |
| ARI RATED HEATING CAP.: BTUH (47) 29800 COP(47) 3.00 BSPP 6.90 MIN.DHR REG IV | | | | | | | | | | | | | |
| BTUH (17) 16400 COP(17) 2.10 | | | | | | | | | | | | | |
| FURNACE TYPE PROPANE GAS | | FURNACE EFFICIENCY 78.00 X AFUE | | | | | | | | | | | |
| HEAT LOSS BTUH | ELEC. COST \$/KWH | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
| 30,000 | \$ 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 473 | 486 | 500 | 514 | 528 | 542 | 556 | 570 | 584 | 612 | 633 | 633 |
| | .06 | \$ 528 | 542 | 556 | 570 | 584 | 598 | 612 | 626 | 639 | 667 | 688 | 688 |
| | .07 | \$ 591 | 605 | 619 | 633 | 646 | 660 | 674 | 688 | 702 | 730 | 751 | 751 |
| | .08 | \$ 653 | 667 | 681 | 695 | 709 | 723 | 737 | 751 | 765 | 793 | 813 | 813 |
| | .09 | \$ 709 | 723 | 737 | 751 | 765 | 779 | 793 | 806 | 820 | 848 | 869 | 869 |
| | .10 | \$ 774 | 786 | 799 | 813 | 827 | 841 | 855 | 869 | 883 | 911 | 932 | 932 |
| | .12 | \$ 897 | 911 | 925 | 939 | 952 | 966 | 980 | 994 | 1008 | 1036 | 1057 | 1057 |
| | .14 | \$ 1015 | 1029 | 1043 | 1057 | 1071 | 1085 | 1099 | 1112 | 1126 | 1154 | 1175 | 1175 |
| | .16 | \$ 1133 | 1147 | 1161 | 1175 | 1189 | 1203 | 1217 | 1231 | 1245 | 1272 | 1293 | 1293 |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 549 | 570 | 591 | 612 | 633 | 653 | 674 | 695 | 716 | 751 | 793 | 793 |
| | .06 | \$ 612 | 633 | 653 | 674 | 695 | 716 | 737 | 758 | 779 | 813 | 855 | 855 |
| | .07 | \$ 667 | 688 | 709 | 730 | 751 | 772 | 793 | 813 | 834 | 869 | 911 | 911 |
| | .08 | \$ 730 | 751 | 772 | 793 | 813 | 834 | 855 | 876 | 897 | 932 | 973 | 973 |
| | .09 | \$ 793 | 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | 994 | 1036 | 1036 |
| | .10 | \$ 848 | 869 | 890 | 911 | 932 | 952 | 973 | 994 | 1015 | 1050 | 1092 | 1092 |
| | .12 | \$ 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1092 | 1112 | 1133 | 1168 | 1210 | 1210 |
| | .14 | \$ 1092 | 1112 | 1133 | 1154 | 1175 | 1196 | 1217 | 1238 | 1259 | 1293 | 1335 | 1335 |
| | .16 | \$ 1210 | 1231 | 1252 | 1272 | 1293 | 1314 | 1335 | 1356 | 1377 | 1412 | 1453 | 1453 |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 619 | 639 | 667 | 688 | 709 | 737 | 758 | 786 | 806 | 855 | 904 | 904 |
| | .06 | \$ 688 | 709 | 731 | 758 | 779 | 806 | 827 | 855 | 876 | 925 | 973 | 973 |
| | .07 | \$ 758 | 779 | 806 | 827 | 848 | 876 | 897 | 925 | 946 | 994 | 1043 | 1043 |
| | .08 | \$ 820 | 841 | 869 | 890 | 911 | 939 | 959 | 987 | 1008 | 1057 | 1106 | 1106 |
| | .09 | \$ 890 | 911 | 932 | 959 | 980 | 1008 | 1029 | 1057 | 1078 | 1126 | 1175 | 1175 |
| | .10 | \$ 952 | 973 | 1001 | 1022 | 1043 | 1071 | 1092 | 1119 | 1140 | 1189 | 1238 | 1238 |
| | .12 | \$ 1092 | 1112 | 1140 | 1161 | 1182 | 1210 | 1231 | 1259 | 1279 | 1328 | 1377 | 1377 |
| | .14 | \$ 1224 | 1245 | 1272 | 1293 | 1314 | 1342 | 1363 | 1391 | 1412 | 1460 | 1509 | 1509 |
| | .16 | \$ 1356 | 1377 | 1405 | 1426 | 1446 | 1474 | 1495 | 1523 | 1544 | 1592 | 1641 | 1641 |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 806 | 855 | 904 | 946 | 994 | 1043 | 1092 | 1133 | 1182 | 1272 | 1370 | 1370 |
| | .06 | \$ 855 | 904 | 952 | 994 | 1043 | 1092 | 1140 | 1182 | 1231 | 1321 | 1419 | 1419 |
| | .07 | \$ 904 | 952 | 1001 | 1043 | 1092 | 1140 | 1189 | 1231 | 1279 | 1370 | 1467 | 1467 |
| | .08 | \$ 959 | 1008 | 1057 | 1098 | 1147 | 1196 | 1245 | 1286 | 1335 | 1426 | 1523 | 1523 |
| | .09 | \$ 1008 | 1057 | 1106 | 1147 | 1196 | 1245 | 1293 | 1335 | 1384 | 1474 | 1572 | 1572 |
| | .10 | \$ 1057 | 1106 | 1154 | 1196 | 1245 | 1293 | 1342 | 1384 | 1432 | 1523 | 1620 | 1620 |
| | .12 | \$ 1154 | 1203 | 1252 | 1293 | 1342 | 1391 | 1439 | 1481 | 1530 | 1620 | 1718 | 1718 |
| | .14 | \$ 1259 | 1307 | 1356 | 1398 | 1446 | 1495 | 1544 | 1586 | 1634 | 1725 | 1822 | 1822 |
| | .16 | \$ 1356 | 1405 | 1453 | 1495 | 1544 | 1592 | 1641 | 1683 | 1732 | 1822 | 1919 | 1919 |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 959 | 1015 | 1071 | 1133 | 1189 | 1245 | 1300 | 1356 | 1412 | 1523 | 1634 | 1634 |
| | .06 | \$ 1015 | 1071 | 1126 | 1189 | 1249 | 1300 | 1356 | 1412 | 1467 | 1579 | 1690 | 1690 |
| | .07 | \$ 1078 | 1133 | 1189 | 1252 | 1307 | 1363 | 1419 | 1474 | 1530 | 1641 | 1752 | 1752 |
| | .08 | \$ 1133 | 1189 | 1245 | 1307 | 1363 | 1419 | 1474 | 1530 | 1586 | 1697 | 1808 | 1808 |
| | .09 | \$ 1189 | 1245 | 1300 | 1363 | 1419 | 1474 | 1530 | 1586 | 1641 | 1752 | 1864 | 1864 |
| | .10 | \$ 1252 | 1307 | 1363 | 1426 | 1481 | 1537 | 1592 | 1648 | 1704 | 1815 | 1926 | 1926 |
| | .12 | \$ 1370 | 1426 | 1481 | 1544 | 1599 | 1655 | 1711 | 1766 | 1822 | 1933 | 2045 | 2045 |
| | .14 | \$ 1481 | 1537 | 1592 | 1655 | 1711 | 1766 | 1822 | 1878 | 1933 | 2045 | 2156 | 2156 |
| | .16 | \$ 1599 | 1655 | 1711 | 1773 | 1829 | 1885 | 1940 | 1996 | 2052 | 2163 | 2274 | 2274 |
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 1154 | 1231 | 1307 | 1384 | 1460 | 1537 | 1613 | 1690 | 1773 | 1926 | 2079 | 2079 |
| | .06 | \$ 1203 | 1279 | 1356 | 1432 | 1509 | 1586 | 1662 | 1739 | 1822 | 1975 | 2128 | 2128 |
| | .07 | \$ 1245 | 1321 | 1398 | 1474 | 1551 | 1627 | 1704 | 1780 | 1864 | 2017 | 2170 | 2170 |
| | .08 | \$ 1293 | 1370 | 1456 | 1523 | 1599 | 1676 | 1752 | 1829 | 1912 | 2065 | 2219 | 2219 |
| | .09 | \$ 1342 | 1418 | 1495 | 1573 | 1648 | 1725 | 1801 | 1878 | 1961 | 2114 | 2267 | 2267 |
| | .10 | \$ 1384 | 1460 | 1537 | 1613 | 1690 | 1766 | 1843 | 1919 | 2003 | 2156 | 2309 | 2309 |
| | .12 | \$ 1481 | 1558 | 1634 | 1711 | 1787 | 1864 | 1940 | 2017 | 2100 | 2253 | 2406 | 2406 |
| | .14 | \$ 1572 | 1648 | 1725 | 1801 | 1878 | 1954 | 2031 | 2107 | 2191 | 2344 | 2497 | 2497 |
| | .16 | \$ 1662 | 1739 | 1815 | 1892 | 1968 | 2045 | 2121 | 2198 | 2281 | 2344 | 2587 | 2587 |
| ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP | | | | | | | | | | | | | |
| .05 .06 .07 .08 .09 .10 .12 .14 .16 --ELECTRIC RATE \$/KWH | | | | | | | | | | | | | |
| THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN. | | | | | | | | | | | | | |

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPQA INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER10.00
 ARI RATED HEATING CAP.: BTUH (47) 29000, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
 BTUH (17) 17000, COP(17) 2.10
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
BTUH KLEC.
 COST
 S/KWH

30,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 514 | 925 |
| .06 | S | 612 | 1112 |
| .07 | S | 716 | 1300 |
| .08 | S | 820 | 1488 |
| .09 | S | 925 | 1669 |
| .10 | S | 1029 | 1857 |
| .12 | S | 1238 | 2232 |
| .14 | S | 1439 | 2601 |
| .16 | S | 1648 | 2977 |

BALANCE POINT 13 DEG.F.

35,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 605 | 1085 |
| .06 | S | 723 | 1300 |
| .07 | S | 841 | 1516 |
| .08 | S | 966 | 1732 |
| .09 | S | 1085 | 1947 |
| .10 | S | 1210 | 2170 |
| .12 | S | 1453 | 2601 |
| .14 | S | 1697 | 3039 |
| .16 | S | 1933 | 3471 |

BALANCE POINT 17 DEG.F.

40,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 695 | 1238 |
| .06 | S | 841 | 1488 |
| .07 | S | 980 | 1732 |
| .08 | S | 1119 | 1982 |
| .09 | S | 1259 | 2232 |
| .10 | S | 1398 | 2476 |
| .12 | S | 1683 | 2977 |
| .14 | S | 1961 | 3471 |
| .16 | S | 2239 | 3965 |

BALANCE POINT 20 DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 904 | 1544 |
| .06 | S | 1085 | 1857 |
| .07 | S | 1266 | 2170 |
| .08 | S | 1453 | 2476 |
| .09 | S | 1627 | 2789 |
| .10 | S | 1808 | 3095 |
| .12 | S | 2170 | 3721 |
| .14 | S | 2538 | 4340 |
| .16 | S | 2893 | 4959 |

BALANCE POINT 25 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1133 | 1857 |
| .06 | S | 1356 | 2232 |
| .07 | S | 1586 | 2601 |
| .08 | S | 1815 | 2977 |
| .09 | S | 2031 | 3345 |
| .10 | S | 2260 | 3721 |
| .12 | S | 2712 | 4465 |
| .14 | S | 3165 | 5210 |
| .16 | S | 3617 | 5954 |

BALANCE POINT 29 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
| S | 60 | 72 | 84 | 96 | 108 | 120 | 144 | 168 | 192 |

--ELECTRIC RATE S/KWH
 --THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER10.00
 ARI RATED HEATING CAP.: BTUH (47) 29000 COP(47) 3.00, BSPP 7.00 MIN.DER REG IV
 BTUH (17) 17000, COP(17) 2.10
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST S/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | |
|-------------------|------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 |
| | \$.05 | \$ 382 | 389 | 403 | 417 | 431 | 445 | 452 | 466 | 479 | 493 | 514 |
| | \$.06 | \$ 438 | 445 | 459 | 473 | 486 | 500 | 507 | 521 | 535 | 549 | 570 |
| | \$.07 | \$ 500 | 507 | 521 | 535 | 549 | 563 | 570 | 584 | 598 | 612 | 633 |
| | \$.08 | \$ 556 | 563 | 571 | 591 | 605 | 619 | 626 | 639 | 653 | 667 | 688 |
| | \$.09 | \$ 612 | 619 | 633 | 646 | 660 | 674 | 681 | 695 | 709 | 723 | 744 |
| | \$.10 | \$ 674 | 681 | 695 | 709 | 723 | 737 | 744 | 758 | 772 | 786 | 806 |
| | \$.12 | \$ 793 | 799 | 813 | 827 | 841 | 855 | 862 | 876 | 890 | 904 | 925 |
| | \$.14 | \$ 904 | 911 | 925 | 939 | 952 | 966 | 973 | 987 | 1001 | 1015 | 1036 |
| | \$.16 | \$ 1022 | 1029 | 1043 | 1057 | 1071 | 1085 | 1092 | 1106 | 1119 | 1133 | 1154 |
| | | | | | | | | | | | | 1182 |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 |
| | \$.05 | \$ 417 | 438 | 452 | 473 | 493 | 514 | 528 | 549 | 570 | 584 | 626 |
| | \$.06 | \$ 473 | 493 | 507 | 528 | 549 | 570 | 584 | 605 | 626 | 639 | 681 |
| | \$.07 | \$ 535 | 556 | 570 | 591 | 612 | 633 | 646 | 667 | 688 | 702 | 744 |
| | \$.08 | \$ 591 | 612 | 626 | 646 | 667 | 688 | 702 | 723 | 744 | 758 | 799 |
| | \$.09 | \$ 646 | 667 | 681 | 702 | 723 | 744 | 758 | 779 | 799 | 813 | 855 |
| | \$.10 | \$ 702 | 723 | 737 | 758 | 779 | 799 | 813 | 834 | 855 | 869 | 911 |
| | \$.12 | \$ 820 | 841 | 855 | 876 | 897 | 918 | 932 | 952 | 973 | 987 | 1029 |
| | \$.14 | \$ 932 | 952 | 966 | 987 | 1008 | 1029 | 1043 | 1064 | 1085 | 1099 | 1140 |
| | \$.16 | \$ 1050 | 1071 | 1085 | 1106 | 1126 | 1147 | 1161 | 1182 | 1203 | 1217 | 1259 |
| | | | | | | | | | | | | 1293 |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 |
| | \$.05 | \$ 473 | 493 | 514 | 535 | 556 | 577 | 598 | 619 | 639 | 667 | 709 |
| | \$.06 | \$ 535 | 556 | 577 | 598 | 619 | 639 | 660 | 681 | 702 | 730 | 772 |
| | \$.07 | \$ 605 | 626 | 646 | 667 | 688 | 709 | 730 | 751 | 772 | 799 | 841 |
| | \$.08 | \$ 667 | 688 | 709 | 730 | 751 | 772 | 793 | 813 | 834 | 862 | 904 |
| | \$.09 | \$ 730 | 751 | 772 | 793 | 813 | 834 | 855 | 876 | 897 | 925 | 966 |
| | \$.10 | \$ 793 | 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | 987 | 1029 |
| | \$.12 | \$ 925 | 946 | 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1092 | 1119 | 1161 |
| | \$.14 | \$ 1050 | 1071 | 1092 | 1112 | 1133 | 1154 | 1175 | 1196 | 1217 | 1245 | 1286 |
| | \$.16 | \$ 1182 | 1203 | 1224 | 1245 | 1266 | 1286 | 1307 | 1328 | 1349 | 1377 | 1419 |
| | | | | | | | | | | | | 1460 |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 |
| | \$.05 | \$ 549 | 584 | 619 | 653 | 688 | 723 | 758 | 793 | 827 | 862 | 932 |
| | \$.06 | \$ 612 | 646 | 681 | 716 | 751 | 786 | 820 | 855 | 890 | 925 | 994 |
| | \$.07 | \$ 681 | 716 | 751 | 786 | 820 | 855 | 890 | 925 | 959 | 994 | 1057 |
| | \$.08 | \$ 744 | 779 | 813 | 848 | 883 | 918 | 952 | 987 | 1022 | 1057 | 1126 |
| | \$.09 | \$ 806 | 841 | 876 | 911 | 946 | 980 | 1015 | 1050 | 1085 | 1119 | 1189 |
| | \$.10 | \$ 869 | 904 | 939 | 973 | 1008 | 1043 | 1078 | 1112 | 1147 | 1182 | 1252 |
| | \$.12 | \$ 994 | 1029 | 1064 | 1099 | 1133 | 1168 | 1203 | 1238 | 1272 | 1307 | 1377 |
| | \$.14 | \$ 1119 | 1154 | 1189 | 1224 | 1259 | 1293 | 1328 | 1363 | 1398 | 1432 | 1502 |
| | \$.16 | \$ 1245 | 1279 | 1314 | 1349 | 1384 | 1419 | 1453 | 1488 | 1523 | 1558 | 1627 |
| | | | | | | | | | | | | 1690 |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 |
| | \$.05 | \$ 633 | 681 | 737 | 786 | 834 | 890 | 939 | 987 | 1043 | 1092 | 1196 |
| | \$.06 | \$ 688 | 737 | 793 | 841 | 890 | 946 | 994 | 1043 | 1099 | 1147 | 1252 |
| | \$.07 | \$ 744 | 793 | 848 | 897 | 946 | 1001 | 1050 | 1099 | 1154 | 1203 | 1307 |
| | \$.08 | \$ 799 | 848 | 904 | 952 | 1001 | 1057 | 1106 | 1154 | 1210 | 1259 | 1363 |
| | \$.09 | \$ 855 | 904 | 959 | 1008 | 1057 | 1112 | 1161 | 1210 | 1266 | 1314 | 1419 |
| | \$.10 | \$ 911 | 959 | 1015 | 1064 | 1112 | 1168 | 1217 | 1266 | 1321 | 1370 | 1474 |
| | \$.12 | \$ 1022 | 1071 | 1126 | 1175 | 1224 | 1279 | 1328 | 1377 | 1432 | 1481 | 1586 |
| | \$.14 | \$ 1133 | 1182 | 1238 | 1286 | 1335 | 1391 | 1439 | 1488 | 1544 | 1592 | 1697 |
| | \$.16 | \$ 1245 | 1293 | 1349 | 1398 | 1446 | 1502 | 1551 | 1599 | 1655 | 1704 | 1808 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

\$.05 .06 .07 .08 .09 .10 .12 .14 .16

--ELECTRIC RATE S/KWH
--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL-FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 30UHPQA/A37AO-A
 HEAT PUMP MODEL: OUTDOOR 30UHPQA INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER10.00
 ARI RATED HEATING CAP.: BTUH (47) 29000 COP(47) 3.00, HSPF 7.00 MIN.DER REG IV
 BTUH (17) 17000 COP(17) 2.10
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | KJ/B.C. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | |
|-------------------|---------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 |
| 30,000 | \$ 410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 417 | 438 | 452 | 473 | 493 | 507 | 528 | 542 | 563 | 584 | 598 | 619 |
| | .06 | \$ 473 | 493 | 507 | 528 | 549 | 563 | 584 | 598 | 619 | 639 | 653 | 674 |
| | .07 | \$ 535 | 556 | 570 | 591 | 612 | 626 | 646 | 660 | 681 | 702 | 716 | 737 |
| | .08 | \$ 591 | 612 | 626 | 646 | 667 | 681 | 702 | 716 | 737 | 758 | 772 | 793 |
| | .09 | \$ 646 | 667 | 681 | 702 | 723 | 737 | 758 | 772 | 793 | 813 | 827 | 848 |
| | .10 | \$ 709 | 730 | 744 | 765 | 786 | 799 | 820 | 834 | 855 | 876 | 890 | 911 |
| | .12 | \$ 827 | 848 | 862 | 883 | 904 | 918 | 939 | 952 | 973 | 994 | 1008 | 1029 |
| | .14 | \$ 939 | 959 | 973 | 994 | 1015 | 1029 | 1050 | 1064 | 1085 | 1106 | 1119 | 1140 |
| | .16 | \$ 1057 | 1078 | 1092 | 1112 | 1133 | 1147 | 1168 | 1182 | 1203 | 1224 | 1238 | 1259 |
| | | | | | | | | | | | | | BALANCE POINT 13 DEG.F. |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 473 | 500 | 528 | 556 | 584 | 612 | 639 | 667 | 695 | 716 | 744 | 772 |
| | .06 | \$ 528 | 556 | 584 | 612 | 639 | 667 | 695 | 723 | 751 | 772 | 799 | 827 |
| | .07 | \$ 591 | 619 | 646 | 674 | 702 | 730 | 758 | 786 | 813 | 834 | 862 | 890 |
| | .08 | \$ 646 | 674 | 702 | 730 | 758 | 786 | 813 | 841 | 869 | 890 | 918 | 946 |
| | .09 | \$ 702 | 730 | 758 | 786 | 813 | 841 | 869 | 897 | 925 | 946 | 973 | 1001 |
| | .10 | \$ 758 | 786 | 813 | 841 | 869 | 897 | 925 | 952 | 980 | 1001 | 1029 | 1057 |
| | .12 | \$ 876 | 904 | 932 | 959 | 987 | 1015 | 1043 | 1071 | 1099 | 1119 | 1147 | 1175 |
| | .14 | \$ 987 | 1015 | 1043 | 1071 | 1099 | 1126 | 1154 | 1182 | 1210 | 1231 | 1259 | 1286 |
| | .16 | \$ 1106 | 1133 | 1161 | 1189 | 1217 | 1245 | 1272 | 1300 | 1328 | 1349 | 1377 | 1405 |
| | | | | | | | | | | | | | BALANCE POINT 17 DEG.F. |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 535 | 570 | 598 | 633 | 660 | 695 | 723 | 751 | 786 | 813 | 848 | 876 |
| | .06 | \$ 598 | 633 | 660 | 695 | 723 | 758 | 786 | 813 | 848 | 876 | 911 | 939 |
| | .07 | \$ 667 | 702 | 730 | 765 | 793 | 827 | 855 | 883 | 918 | 946 | 980 | 1008 |
| | .08 | \$ 730 | 765 | 793 | 827 | 855 | 890 | 918 | 946 | 980 | 1008 | 1043 | 1071 |
| | .09 | \$ 793 | 827 | 855 | 890 | 918 | 952 | 980 | 1008 | 1043 | 1071 | 1106 | 1133 |
| | .10 | \$ 855 | 890 | 918 | 952 | 980 | 1015 | 1043 | 1071 | 1106 | 1133 | 1168 | 1196 |
| | .12 | \$ 987 | 1022 | 1050 | 1085 | 1112 | 1147 | 1175 | 1203 | 1238 | 1266 | 1300 | 1328 |
| | .14 | \$ 1112 | 1147 | 1175 | 1210 | 1238 | 1272 | 1300 | 1328 | 1363 | 1391 | 1426 | 1453 |
| | .16 | \$ 1245 | 1279 | 1307 | 1342 | 1370 | 1405 | 1432 | 1460 | 1495 | 1523 | 1558 | 1586 |
| | | | | | | | | | | | | | BALANCE POINT 20 DEG.F. |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 660 | 709 | 758 | 806 | 855 | 904 | 952 | 1001 | 1050 | 1099 | 1154 | 1203 |
| | .06 | \$ 723 | 772 | 820 | 869 | 918 | 966 | 1015 | 1064 | 1112 | 1161 | 1217 | 1266 |
| | .07 | \$ 793 | 841 | 890 | 939 | 987 | 1036 | 1085 | 1133 | 1182 | 1231 | 1286 | 1335 |
| | .08 | \$ 855 | 904 | 952 | 1001 | 1050 | 1099 | 1147 | 1196 | 1245 | 1293 | 1349 | 1398 |
| | .09 | \$ 918 | 966 | 1015 | 1064 | 1112 | 1161 | 1210 | 1259 | 1307 | 1356 | 1412 | 1460 |
| | .10 | \$ 980 | 1029 | 1078 | 1126 | 1175 | 1224 | 1272 | 1321 | 1370 | 1419 | 1474 | 1523 |
| | .12 | \$ 1106 | 1154 | 1203 | 1252 | 1300 | 1349 | 1398 | 1446 | 1495 | 1544 | 1599 | 1648 |
| | .14 | \$ 1231 | 1279 | 1328 | 1377 | 1426 | 1474 | 1523 | 1572 | 1620 | 1669 | 1725 | 1773 |
| | .16 | \$ 1356 | 1405 | 1453 | 1502 | 1551 | 1599 | 1648 | 1697 | 1745 | 1794 | 1850 | 1899 |
| | | | | | | | | | | | | | BALANCE POINT 25 DEG.F. |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 793 | 862 | 939 | 1008 | 1085 | 1161 | 1231 | 1307 | 1377 | 1453 | 1523 | 1599 |
| | .06 | \$ 848 | 918 | 994 | 1064 | 1140 | 1217 | 1286 | 1363 | 1432 | 1509 | 1579 | 1655 |
| | .07 | \$ 904 | 973 | 1050 | 1119 | 1196 | 1272 | 1342 | 1419 | 1488 | 1565 | 1634 | 1711 |
| | .08 | \$ 959 | 1029 | 1106 | 1175 | 1252 | 1328 | 1398 | 1474 | 1544 | 1620 | 1690 | 1766 |
| | .09 | \$ 1015 | 1085 | 1161 | 1231 | 1307 | 1384 | 1453 | 1530 | 1599 | 1676 | 1745 | 1827 |
| | .10 | \$ 1071 | 1140 | 1217 | 1286 | 1363 | 1439 | 1509 | 1586 | 1655 | 1732 | 1801 | 1878 |
| | .12 | \$ 1182 | 1252 | 1328 | 1398 | 1474 | 1551 | 1620 | 1697 | 1766 | 1843 | 1912 | 1983 |
| | .14 | \$ 1293 | 1363 | 1439 | 1509 | 1586 | 1662 | 1732 | 1808 | 1878 | 1954 | 2024 | 2100 |
| | .16 | \$ 1405 | 1474 | 1551 | 1620 | 1697 | 1773 | 1843 | 1919 | 1989 | 2065 | 2135 | 2212 |
| | | | | | | | | | | | | | BALANCE POINT 29 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
 .60 .72 .84 .96 .108 .120 .144 .168 .192

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH (95) 30000 SEER10.00
 ARI RATED HEATING CAP.: BTUH (47) 29000 COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
 BTUH (17) 17000 COP(17) 2.10
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 | PROPSANE GAS COST - \$/GALLON | |
|-------------------|-------------------------|---------|------|------|------|------|------|------|------|------|------|------|---|--|--|
| 30,000 | \$ 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 459 | 473 | 486 | 500 | 514 | 528 | 542 | 556 | 570 | 598 | 619 | 619 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 514 | 528 | 542 | 556 | 570 | 584 | 598 | 612 | 626 | 653 | 674 | 674 | | |
| | .07 | \$ 577 | 591 | 605 | 619 | 633 | 646 | 660 | 674 | 688 | 716 | 737 | 737 | | |
| | .08 | \$ 633 | 646 | 660 | 674 | 688 | 702 | 716 | 730 | 744 | 772 | 793 | 793 | | |
| | .09 | \$ 688 | 702 | 716 | 730 | 744 | 758 | 772 | 786 | 799 | 827 | 848 | 848 | | |
| | .10 | \$ 751 | 765 | 779 | 793 | 806 | 820 | 834 | 848 | 862 | 890 | 911 | 911 | | |
| | .12 | \$ 869 | 883 | 897 | 911 | 925 | 939 | 952 | 966 | 980 | 1008 | 1029 | 1029 | | |
| | .14 | \$ 980 | 994 | 1008 | 1022 | 1036 | 1050 | 1064 | 1078 | 1092 | 1119 | 1140 | 1140 | BALANCE POINT 13 DEG.F. | |
| | .16 | \$ 1099 | 1112 | 1126 | 1140 | 1154 | 1168 | 1182 | 1196 | 1210 | 1238 | 1259 | 1259 | | |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 535 | 556 | 577 | 598 | 619 | 639 | 660 | 681 | 702 | 737 | 779 | 779 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 591 | 612 | 633 | 653 | 674 | 695 | 716 | 737 | 758 | 793 | 834 | 834 | | |
| | .07 | \$ 653 | 674 | 695 | 716 | 737 | 758 | 779 | 799 | 820 | 855 | 897 | 897 | | |
| | .08 | \$ 709 | 730 | 751 | 772 | 793 | 813 | 834 | 855 | 876 | 911 | 952 | 952 | | |
| | .09 | \$ 765 | 786 | 806 | 827 | 848 | 869 | 890 | 911 | 932 | 966 | 1008 | 1008 | | |
| | .10 | \$ 820 | 841 | 862 | 883 | 904 | 925 | 946 | 966 | 987 | 1022 | 1064 | 1064 | | |
| | .12 | \$ 939 | 959 | 980 | 1001 | 1022 | 1043 | 1064 | 1085 | 1106 | 1140 | 1182 | 1182 | | |
| | .14 | \$ 1050 | 1071 | 1092 | 1112 | 1133 | 1154 | 1175 | 1196 | 1217 | 1252 | 1293 | 1293 | BALANCE POINT 17 DEG.F. | |
| | .16 | \$ 1168 | 1189 | 1210 | 1231 | 1252 | 1272 | 1293 | 1314 | 1335 | 1370 | 1412 | 1412 | | |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 605 | 626 | 653 | 674 | 695 | 723 | 744 | 772 | 793 | 841 | 890 | 890 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 667 | 688 | 716 | 737 | 758 | 786 | 806 | 834 | 855 | 904 | 952 | 952 | | |
| | .07 | \$ 737 | 758 | 786 | 806 | 827 | 855 | 876 | 904 | 925 | 973 | 1022 | 1022 | | |
| | .08 | \$ 799 | 820 | 848 | 869 | 890 | 918 | 939 | 966 | 987 | 1036 | 1085 | 1085 | | |
| | .09 | \$ 862 | 883 | 911 | 932 | 952 | 980 | 1001 | 1029 | 1050 | 1099 | 1147 | 1147 | | |
| | .10 | \$ 925 | 946 | 973 | 994 | 1015 | 1043 | 1064 | 1092 | 1112 | 1161 | 1210 | 1210 | | |
| | .12 | \$ 1057 | 1078 | 1106 | 1126 | 1147 | 1175 | 1196 | 1224 | 1245 | 1293 | 1342 | 1342 | | |
| | .14 | \$ 1182 | 1203 | 1231 | 1252 | 1272 | 1300 | 1321 | 1349 | 1370 | 1419 | 1467 | 1467 | BALANCE POINT 20 DEG.F. | |
| | .16 | \$ 1314 | 1335 | 1363 | 1384 | 1405 | 1432 | 1453 | 1481 | 1502 | 1551 | 1599 | 1599 | | |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 765 | 799 | 841 | 876 | 911 | 952 | 987 | 1029 | 1064 | 1140 | 1217 | 1217 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 827 | 862 | 904 | 939 | 973 | 1015 | 1050 | 1092 | 1126 | 1203 | 1279 | 1279 | | |
| | .07 | \$ 897 | 932 | 973 | 1008 | 1043 | 1085 | 1119 | 1161 | 1196 | 1272 | 1349 | 1349 | | |
| | .08 | \$ 959 | 994 | 1036 | 1071 | 1106 | 1147 | 1182 | 1224 | 1259 | 1335 | 1412 | 1412 | | |
| | .09 | \$ 1022 | 1057 | 1099 | 1133 | 1168 | 1210 | 1245 | 1286 | 1321 | 1398 | 1474 | 1474 | | |
| | .10 | \$ 1085 | 1119 | 1161 | 1196 | 1231 | 1272 | 1307 | 1349 | 1384 | 1460 | 1537 | 1537 | | |
| | .12 | \$ 1210 | 1245 | 1286 | 1321 | 1356 | 1398 | 1432 | 1474 | 1509 | 1586 | 1662 | 1662 | | |
| | .14 | \$ 1335 | 1370 | 1412 | 1446 | 1481 | 1523 | 1558 | 1599 | 1634 | 1711 | 1787 | 1787 | BALANCE POINT 25 DEG.F. | |
| | .16 | \$ 1460 | 1495 | 1537 | 1572 | 1606 | 1648 | 1683 | 1725 | 1759 | 1836 | 1912 | 1912 | | |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| | .05 | \$ 946 | 1001 | 1057 | 1119 | 1175 | 1231 | 1286 | 1342 | 1398 | 1509 | 1620 | 1620 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| | .06 | \$ 1001 | 1057 | 1112 | 1175 | 1231 | 1286 | 1342 | 1398 | 1453 | 1565 | 1676 | 1676 | | |
| | .07 | \$ 1057 | 1112 | 1168 | 1231 | 1286 | 1342 | 1398 | 1453 | 1509 | 1620 | 1732 | 1732 | | |
| | .08 | \$ 1112 | 1168 | 1224 | 1286 | 1342 | 1398 | 1453 | 1509 | 1565 | 1676 | 1787 | 1787 | | |
| | .09 | \$ 1168 | 1224 | 1279 | 1342 | 1398 | 1453 | 1509 | 1565 | 1620 | 1732 | 1843 | 1843 | | |
| | .10 | \$ 1224 | 1279 | 1335 | 1398 | 1453 | 1509 | 1565 | 1620 | 1676 | 1787 | 1899 | 1899 | | |
| | .12 | \$ 1335 | 1391 | 1446 | 1509 | 1565 | 1620 | 1676 | 1732 | 1787 | 1899 | 2010 | 2010 | BALANCE POINT 29 DEG.F. | |
| | .14 | \$ 1446 | 1502 | 1558 | 1620 | 1676 | 1732 | 1787 | 1843 | 1899 | 2010 | 2121 | 2121 | | |
| | .16 | \$ 1558 | 1613 | 1669 | 1732 | 1787 | 1843 | 1899 | 1954 | 2010 | 2121 | 2232 | 2232 | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16

---ELECTRIC RATE \$/KWH
---THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A42AS-A
ARI RATED COOLING CAP.: BTUH(95°) 28600 SEER 9.50
ARI RATED HEATING CAP.: BTUH (47°) 29400 COP(47°) 3.00, ESEPF 7.00 MIN.DHR REG IV
BTUH (17°) 16700 COP(17°) 2.10
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS
BTUH ELEC.
COST
\$/KWH

30,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 528 | 925 |
| .06 | S | 633 | 1112 |
| .07 | S | 737 | 1300 |
| .08 | S | 841 | 1488 |
| .09 | S | 952 | 1669 |
| .10 | S | 1051 | 1857 |
| .12 | S | 1259 | 2232 |
| .14 | S | 1467 | 2601 |
| .16 | S | 1683 | 2977 |

BALANCE POINT 14 DEG.F.

35,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 619 | 1085 |
| .06 | S | 744 | 1300 |
| .07 | S | 862 | 1516 |
| .08 | S | 987 | 1732 |
| .09 | S | 1112 | 1947 |
| .10 | S | 1231 | 2170 |
| .12 | S | 1481 | 2601 |
| .14 | S | 1732 | 3039 |
| .16 | S | 1975 | 3471 |

BALANCE POINT 17 DEG.F.

40,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 716 | 1238 |
| .06 | S | 855 | 1488 |
| .07 | S | 1001 | 1732 |
| .08 | S | 1140 | 1982 |
| .09 | S | 1286 | 2232 |
| .10 | S | 1426 | 2476 |
| .12 | S | 1718 | 2977 |
| .14 | S | 2003 | 3471 |
| .16 | S | 2281 | 3965 |

BALANCE POINT 21 DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 925 | 1544 |
| .06 | S | 1112 | 1857 |
| .07 | S | 1293 | 2170 |
| .08 | S | 1474 | 2476 |
| .09 | S | 1662 | 2789 |
| .10 | S | 1850 | 3095 |
| .12 | S | 2212 | 3721 |
| .14 | S | 2587 | 4340 |
| .16 | S | 2963 | 4959 |

BALANCE POINT 26 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1154 | 1857 |
| .06 | S | 1391 | 2232 |
| .07 | S | 1620 | 2601 |
| .08 | S | 1850 | 2977 |
| .09 | S | 2086 | 3345 |
| .10 | S | 2316 | 3721 |
| .12 | S | 2782 | 4465 |
| .14 | S | 3241 | 5210 |
| .16 | S | 3707 | 5954 |

BALANCE POINT 31 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

S .05 .06 .07 .08 .09 .10 .12 .14 .16
60 72 84 96 108 120 144 168 192

--ELECTRIC RATE \$/KWH
--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A42AS-A
ARI RATED COOLING CAP.: BTUH(95) 28600 SEER 9.50
ARI RATED HEATING CAP.: BTUH (47) 29400 COP(47) 3.00 HSPP 7.00 MIN.DHR REG IV
BTUH (17) 16700 COP(17) 2.10
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | | |
| 30,000 | \$ 278 | 319 | 361 | 403 | 445 | 486 | 528 | 563 | 605 | 646 | 730 | 813 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 389 | 396 | 410 | 424 | 438 | 452 | 459 | 473 | 486 | 500 | 521 | 549 |
| | .06 | \$ 452 | 459 | 473 | 486 | 500 | 514 | 521 | 535 | 549 | 563 | 584 | 612 |
| | .07 | \$ 507 | 514 | 528 | 542 | 556 | 570 | 577 | 591 | 605 | 619 | 639 | 667 |
| | .08 | \$ 570 | 577 | 591 | 605 | 619 | 633 | 639 | 653 | 667 | 681 | 702 | 730 |
| | .09 | \$ 626 | 633 | 646 | 660 | 674 | 688 | 695 | 709 | 723 | 737 | 758 | 786 |
| | .10 | \$ 688 | 695 | 709 | 723 | 737 | 751 | 758 | 772 | 786 | 799 | 820 | 848 |
| | .12 | \$ 806 | 813 | 827 | 841 | 855 | 869 | 876 | 890 | 904 | 918 | 939 | 966 |
| | .14 | \$ 932 | 939 | 952 | 966 | 980 | 994 | 1001 | 1015 | 1029 | 1043 | 1064 | 1092 |
| | .16 | \$ 1050 | 1057 | 1071 | 1085 | 1099 | 1112 | 1119 | 1133 | 1147 | 1161 | 1182 | 1210 |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 424 | 445 | 459 | 479 | 500 | 521 | 535 | 556 | 577 | 591 | 633 | 667 |
| | .06 | \$ 486 | 507 | 521 | 542 | 563 | 584 | 598 | 619 | 639 | 653 | 695 | 730 |
| | .07 | \$ 542 | 563 | 577 | 598 | 619 | 639 | 653 | 674 | 695 | 709 | 751 | 786 |
| | .08 | \$ 605 | 626 | 639 | 660 | 681 | 702 | 716 | 737 | 758 | 772 | 813 | 848 |
| | .09 | \$ 660 | 681 | 695 | 716 | 737 | 758 | 772 | 793 | 813 | 827 | 869 | 904 |
| | .10 | \$ 723 | 744 | 758 | 779 | 799 | 820 | 834 | 855 | 876 | 890 | 932 | 966 |
| | .12 | \$ 841 | 862 | 876 | 897 | 918 | 939 | 952 | 973 | 994 | 1008 | 1050 | 1085 |
| | .14 | \$ 959 | 980 | 994 | 1015 | 1036 | 1057 | 1071 | 1092 | 1112 | 1126 | 1168 | 1203 |
| | .16 | \$ 1078 | 1099 | 1112 | 1133 | 1154 | 1175 | 1189 | 1210 | 1231 | 1245 | 1286 | 1321 |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 486 | 507 | 528 | 549 | 570 | 591 | 612 | 633 | 653 | 681 | 723 | 765 |
| | .06 | \$ 549 | 570 | 591 | 612 | 633 | 653 | 674 | 695 | 716 | 744 | 786 | 827 |
| | .07 | \$ 619 | 639 | 660 | 681 | 702 | 723 | 744 | 765 | 786 | 813 | 855 | 897 |
| | .08 | \$ 681 | 702 | 723 | 744 | 765 | 786 | 806 | 827 | 848 | 876 | 918 | 959 |
| | .09 | \$ 751 | 772 | 793 | 813 | 834 | 855 | 876 | 897 | 918 | 946 | 987 | 1029 |
| | .10 | \$ 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | 980 | 1008 | 1050 | 1092 |
| | .12 | \$ 946 | 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1092 | 1112 | 1140 | 1182 | 1224 |
| | .14 | \$ 1078 | 1099 | 1119 | 1140 | 1161 | 1182 | 1203 | 1224 | 1245 | 1272 | 1314 | 1356 |
| | .16 | \$ 1210 | 1231 | 1252 | 1272 | 1293 | 1314 | 1335 | 1356 | 1377 | 1405 | 1446 | 1488 |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 563 | 598 | 633 | 667 | 702 | 737 | 772 | 806 | 841 | 876 | 946 | 1008 |
| | .06 | \$ 626 | 660 | 695 | 730 | 765 | 799 | 834 | 869 | 904 | 939 | 1008 | 1071 |
| | .07 | \$ 695 | 730 | 765 | 799 | 834 | 869 | 904 | 939 | 973 | 1008 | 1078 | 1140 |
| | .08 | \$ 758 | 793 | 827 | 862 | 897 | 932 | 966 | 1001 | 1036 | 1071 | 1140 | 1203 |
| | .09 | \$ 820 | 855 | 890 | 925 | 959 | 994 | 1029 | 1064 | 1099 | 1133 | 1203 | 1266 |
| | .10 | \$ 890 | 925 | 959 | 994 | 1029 | 1064 | 1099 | 1133 | 1168 | 1203 | 1272 | 1335 |
| | .12 | \$ 1022 | 1057 | 1092 | 1126 | 1161 | 1196 | 1231 | 1266 | 1300 | 1335 | 1405 | 1467 |
| | .14 | \$ 1147 | 1182 | 1217 | 1252 | 1286 | 1321 | 1356 | 1391 | 1426 | 1460 | 1530 | 1592 |
| | .16 | \$ 1279 | 1314 | 1349 | 1384 | 1419 | 1453 | 1488 | 1523 | 1558 | 1592 | 1662 | 1725 |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 639 | 688 | 744 | 793 | 841 | 897 | 946 | 994 | 1050 | 1099 | 1203 | 1300 |
| | .06 | \$ 695 | 744 | 799 | 848 | 897 | 952 | 1001 | 1050 | 1106 | 1154 | 1259 | 1356 |
| | .07 | \$ 758 | 806 | 862 | 911 | 959 | 1015 | 1064 | 1112 | 1168 | 1217 | 1321 | 1419 |
| | .08 | \$ 813 | 862 | 918 | 966 | 1015 | 1071 | 1119 | 1168 | 1224 | 1272 | 1377 | 1474 |
| | .09 | \$ 869 | 918 | 973 | 1022 | 1071 | 1126 | 1175 | 1224 | 1279 | 1328 | 1432 | 1530 |
| | .10 | \$ 925 | 973 | 1029 | 1078 | 1126 | 1182 | 1231 | 1279 | 1335 | 1384 | 1488 | 1586 |
| | .12 | \$ 1043 | 1092 | 1147 | 1196 | 1245 | 1300 | 1349 | 1398 | 1453 | 1502 | 1606 | 1704 |
| | .14 | \$ 1154 | 1203 | 1259 | 1307 | 1356 | 1412 | 1460 | 1509 | 1565 | 1613 | 1718 | 1815 |
| | .16 | \$ 1272 | 1321 | 1377 | 1426 | 1474 | 1530 | 1579 | 1627 | 1683 | 1732 | 1836 | 1933 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

\$.05 .06 .07 .08 .09 .10 .12 .14 .16

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 30UHPOA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A42AS-A
 ARI RATED COOLING CAP.: BTUH(95) 28600 SEER 9.50
 ARI RATED HEATING CAP.: BTUH (47) 29400 COP(47) 3.00, HSPP 7.00 MIN.DHR REG IV
 BTUH (17) 16700 COP(17) 2.10
 FURNACE TYPE: FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | <--THEORETICAL HEATING COST * FURNACE ONLY |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|--|--|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | |
| 30,000 | \$ 410 | 466 | 521 | 584 | 639 | 702 | 758 | 820 | 876 | 939 | 994 | 1050 | <--THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 424 | 445 | 459 | 479 | 500 | 514 | 535 | 549 | 570 | 591 | 605 | 626 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 486 | 507 | 521 | 542 | 563 | 577 | 598 | 612 | 633 | 653 | 667 | 688 | |
| | .07 | \$ 542 | 563 | 577 | 598 | 619 | 633 | 653 | 667 | 688 | 709 | 723 | 744 | |
| | .08 | \$ 605 | 626 | 639 | 660 | 681 | 695 | 716 | 730 | 751 | 772 | 786 | 806 | |
| | .09 | \$ 660 | 681 | 695 | 716 | 737 | 751 | 772 | 786 | 806 | 827 | 841 | 862 | |
| | .10 | \$ 723 | 744 | 758 | 779 | 799 | 813 | 834 | 848 | 869 | 890 | 904 | 925 | |
| | .12 | \$ 841 | 862 | 876 | 897 | 918 | 932 | 952 | 966 | 987 | 1008 | 1022 | 1043 | |
| | .14 | \$ 966 | 987 | 1001 | 1022 | 1043 | 1057 | 1078 | 1092 | 1112 | 1133 | 1147 | 1168 | |
| | .16 | \$ 1085 | 1106 | 1119 | 1140 | 1161 | 1175 | 1196 | 1210 | 1231 | 1252 | 1266 | 1286 | |
| | | | | | | | | | | | | | | BALANCE POINT 14 DEG.F. |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | <--THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 479 | 507 | 535 | 563 | 591 | 619 | 646 | 674 | 702 | 723 | 751 | 779 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 542 | 570 | 598 | 626 | 653 | 681 | 709 | 737 | 765 | 786 | 813 | 841 | |
| | .07 | \$ 598 | 626 | 653 | 681 | 709 | 737 | 765 | 793 | 820 | 841 | 869 | 897 | |
| | .08 | \$ 660 | 688 | 716 | 744 | 772 | 799 | 827 | 855 | 883 | 904 | 932 | 959 | |
| | .09 | \$ 716 | 744 | 772 | 799 | 827 | 855 | 883 | 911 | 939 | 959 | 987 | 1015 | |
| | .10 | \$ 779 | 806 | 834 | 862 | 890 | 918 | 946 | 973 | 1001 | 1022 | 1050 | 1078 | |
| | .12 | \$ 897 | 925 | 952 | 980 | 1008 | 1036 | 1064 | 1092 | 1119 | 1140 | 1168 | 1196 | |
| | .14 | \$ 1015 | 1043 | 1071 | 1099 | 1126 | 1154 | 1182 | 1210 | 1238 | 1259 | 1286 | 1314 | |
| | .16 | \$ 1133 | 1161 | 1189 | 1217 | 1245 | 1272 | 1300 | 1328 | 1356 | 1377 | 1405 | 1432 | |
| | | | | | | | | | | | | | | BALANCE POINT 17 DEG.F. |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | <--THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 549 | 584 | 612 | 646 | 674 | 709 | 737 | 765 | 799 | 827 | 862 | 890 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 612 | 646 | 674 | 709 | 737 | 772 | 799 | 827 | 862 | 890 | 925 | 952 | |
| | .07 | \$ 681 | 716 | 744 | 779 | 806 | 841 | 869 | 897 | 932 | 959 | 994 | 1022 | |
| | .08 | \$ 744 | 779 | 806 | 841 | 869 | 904 | 932 | 959 | 994 | 1022 | 1057 | 1085 | |
| | .09 | \$ 813 | 848 | 876 | 911 | 939 | 973 | 1001 | 1036 | 1064 | 1092 | 1126 | 1154 | |
| | .10 | \$ 876 | 911 | 939 | 973 | 1001 | 1036 | 1064 | 1092 | 1126 | 1154 | 1189 | 1217 | |
| | .12 | \$ 1008 | 1043 | 1071 | 1106 | 1133 | 1168 | 1196 | 1224 | 1259 | 1286 | 1321 | 1349 | |
| | .14 | \$ 1140 | 1175 | 1203 | 1238 | 1266 | 1300 | 1328 | 1356 | 1391 | 1419 | 1453 | 1481 | |
| | .16 | \$ 1272 | 1307 | 1335 | 1370 | 1398 | 1432 | 1460 | 1488 | 1523 | 1551 | 1586 | 1613 | |
| | | | | | | | | | | | | | | BALANCE POINT 21 DEG.F. |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | <--THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 674 | 723 | 772 | 820 | 869 | 918 | 966 | 1015 | 1064 | 1112 | 1168 | 1217 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 737 | 786 | 834 | 883 | 932 | 980 | 1029 | 1078 | 1126 | 1175 | 1231 | 1279 | |
| | .07 | \$ 806 | 855 | 904 | 952 | 1001 | 1050 | 1099 | 1147 | 1196 | 1245 | 1300 | 1349 | |
| | .08 | \$ 869 | 918 | 966 | 1015 | 1064 | 1112 | 1161 | 1210 | 1259 | 1307 | 1363 | 1412 | |
| | .09 | \$ 932 | 980 | 1029 | 1078 | 1126 | 1175 | 1224 | 1272 | 1321 | 1370 | 1426 | 1474 | |
| | .10 | \$ 1001 | 1050 | 1099 | 1147 | 1196 | 1245 | 1293 | 1342 | 1391 | 1439 | 1495 | 1544 | |
| | .12 | \$ 1133 | 1182 | 1231 | 1279 | 1328 | 1377 | 1426 | 1474 | 1523 | 1572 | 1627 | 1676 | |
| | .14 | \$ 1259 | 1307 | 1356 | 1405 | 1453 | 1502 | 1551 | 1599 | 1648 | 1697 | 1752 | 1801 | |
| | .16 | \$ 1391 | 1439 | 1488 | 1537 | 1586 | 1634 | 1683 | 1732 | 1780 | 1829 | 1885 | 1933 | |
| | | | | | | | | | | | | | | BALANCE POINT 26 DEG.F. |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | <--THEORETICAL HEATING COST * FURNACE ONLY | |
| | .05 | \$ 799 | 869 | 946 | 1015 | 1092 | 1168 | 1238 | 1314 | 1384 | 1460 | 1530 | 1606 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| | .06 | \$ 855 | 925 | 1001 | 1071 | 1147 | 1224 | 1293 | 1370 | 1439 | 1516 | 1586 | 1662 | |
| | .07 | \$ 918 | 987 | 1064 | 1133 | 1210 | 1286 | 1356 | 1432 | 1502 | 1579 | 1648 | 1725 | |
| | .08 | \$ 973 | 1043 | 1119 | 1189 | 1266 | 1342 | 1412 | 1488 | 1558 | 1634 | 1704 | 1780 | |
| | .09 | \$ 1029 | 1099 | 1175 | 1245 | 1321 | 1398 | 1467 | 1544 | 1613 | 1690 | 1759 | 1836 | |
| | .10 | \$ 1085 | 1154 | 1231 | 1300 | 1377 | 1453 | 1523 | 1599 | 1669 | 1745 | 1815 | 1892 | |
| | .12 | \$ 1203 | 1272 | 1349 | 1419 | 1495 | 1572 | 1641 | 1718 | 1787 | 1864 | 1933 | 2010 | |
| | .14 | \$ 1314 | 1384 | 1460 | 1530 | 1606 | 1683 | 1752 | 1829 | 1899 | 1975 | 2045 | 2121 | |
| | .16 | \$ 1432 | 1502 | 1579 | 1648 | 1725 | 1801 | 1871 | 1947 | 2017 | 2093 | 2163 | 2239 | |
| | | | | | | | | | | | | | | BALANCE POINT 31 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| s .05 | .06 | .07 | .08 | .09 | .10 | .11 | .12 | .13 | .14 | .15 |
| s 60 | 72 | 84 | 96 | 108 | 120 | 144 | 168 | 192 | | |

| | | | | | | | | | | |
|-------------------------|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <--ELECTRIC RATE \$/KWH | <--THEORETICAL AIR CONDITIONING COST | | | | | | | | | |
| s .05 | .06 | .07 | .08 | .09 | .10 | .11 | .12 | .13 | .14 | .15 |
| s 60 | 72 | 84 | 96 | 108 | 120 | 144 | 168 | 192 | | |

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOA INDOOR A42AS-A
 ARI RATED COOLING CAP.: BTUH(95) 28600 SEER 9.50
 ARI RATED HEATING CAP.: BTUH (47) 29400 COP(47) 3.00, RSPE 7.00 MIN.DHR REG IV
 BTUH (17) 16700 COP(17) 2.10
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
| 30,000 | \$ 535 | 577 | 626 | 667 | 709 | 758 | 799 | 848 | 890 | 980 | 1071 | 1071 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 466 | 479 | 493 | 507 | 521 | 535 | 549 | 563 | 577 | 605 | 626 | 626 |
| | .06 | \$ 528 | 542 | 556 | 570 | 584 | 598 | 612 | 626 | 639 | 667 | 688 | 688 |
| | .07 | \$ 584 | 598 | 612 | 626 | 639 | 653 | 667 | 681 | 695 | 723 | 744 | 744 |
| | .08 | \$ 646 | 660 | 674 | 688 | 702 | 716 | 730 | 744 | 758 | 786 | 806 | 806 |
| | .09 | \$ 702 | 716 | 730 | 744 | 758 | 772 | 786 | 799 | 813 | 841 | 862 | 862 |
| | .10 | \$ 765 | 779 | 793 | 806 | 820 | 834 | 848 | 862 | 876 | 904 | 925 | 925 |
| | .12 | \$ 883 | 897 | 911 | 925 | 939 | 952 | 966 | 980 | 994 | 1022 | 1043 | 1043 |
| | .14 | \$ 1008 | 1022 | 1036 | 1050 | 1064 | 1078 | 1092 | 1106 | 1119 | 1147 | 1168 | 1168 |
| | .16 | \$ 1126 | 1140 | 1154 | 1168 | 1182 | 1196 | 1210 | 1224 | 1238 | 1266 | 1286 | 1286 |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 542 | 563 | 584 | 605 | 626 | 646 | 667 | 688 | 709 | 744 | 786 | 786 |
| | .06 | \$ 605 | 626 | 646 | 667 | 688 | 709 | 730 | 751 | 772 | 806 | 848 | 848 |
| | .07 | \$ 660 | 681 | 702 | 723 | 744 | 765 | 786 | 806 | 827 | 862 | 904 | 904 |
| | .08 | \$ 723 | 744 | 765 | 786 | 806 | 827 | 848 | 869 | 890 | 925 | 966 | 966 |
| | .09 | \$ 779 | 799 | 820 | 841 | 862 | 883 | 904 | 925 | 946 | 980 | 1022 | 1022 |
| | .10 | \$ 841 | 862 | 883 | 904 | 925 | 946 | 966 | 987 | 1008 | 1043 | 1085 | 1085 |
| | .12 | \$ 959 | 980 | 1001 | 1022 | 1043 | 1064 | 1085 | 1106 | 1126 | 1161 | 1203 | 1203 |
| | .14 | \$ 1078 | 1099 | 1119 | 1140 | 1161 | 1182 | 1203 | 1224 | 1245 | 1279 | 1321 | 1321 |
| | .16 | \$ 1196 | 1217 | 1238 | 1259 | 1279 | 1300 | 1321 | 1342 | 1363 | 1398 | 1439 | 1439 |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 619 | 639 | 667 | 688 | 709 | 737 | 758 | 786 | 806 | 855 | 904 | 904 |
| | .06 | \$ 681 | 702 | 730 | 751 | 772 | 799 | 820 | 848 | 869 | 918 | 966 | 966 |
| | .07 | \$ 751 | 772 | 799 | 820 | 841 | 869 | 890 | 918 | 939 | 987 | 1036 | 1036 |
| | .08 | \$ 813 | 834 | 862 | 883 | 904 | 932 | 952 | 980 | 1001 | 1050 | 1099 | 1099 |
| | .09 | \$ 883 | 904 | 932 | 952 | 973 | 1001 | 1022 | 1050 | 1071 | 1119 | 1168 | 1168 |
| | .10 | \$ 946 | 966 | 994 | 1015 | 1036 | 1064 | 1085 | 1112 | 1133 | 1182 | 1231 | 1231 |
| | .12 | \$ 1078 | 1099 | 1126 | 1147 | 1168 | 1196 | 1217 | 1245 | 1266 | 1314 | 1363 | 1363 |
| | .14 | \$ 1210 | 1231 | 1259 | 1279 | 1300 | 1328 | 1349 | 1377 | 1398 | 1446 | 1495 | 1495 |
| | .16 | \$ 1342 | 1363 | 1391 | 1412 | 1432 | 1460 | 1481 | 1509 | 1530 | 1579 | 1627 | 1627 |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 779 | 813 | 855 | 890 | 925 | 966 | 1001 | 1043 | 1078 | 1154 | 1231 | 1231 |
| | .06 | \$ 841 | 876 | 918 | 952 | 987 | 1029 | 1064 | 1106 | 1140 | 1217 | 1293 | 1293 |
| | .07 | \$ 911 | 946 | 987 | 1022 | 1057 | 1099 | 1133 | 1175 | 1210 | 1286 | 1363 | 1363 |
| | .08 | \$ 973 | 1008 | 1050 | 1085 | 1119 | 1161 | 1196 | 1238 | 1272 | 1349 | 1426 | 1426 |
| | .09 | \$ 1036 | 1071 | 1112 | 1147 | 1182 | 1224 | 1259 | 1300 | 1335 | 1412 | 1488 | 1488 |
| | .10 | \$ 1106 | 1140 | 1182 | 1217 | 1252 | 1293 | 1328 | 1370 | 1405 | 1481 | 1558 | 1558 |
| | .12 | \$ 1238 | 1272 | 1314 | 1349 | 1384 | 1426 | 1460 | 1502 | 1537 | 1613 | 1690 | 1690 |
| | .14 | \$ 1363 | 1398 | 1439 | 1474 | 1509 | 1551 | 1586 | 1627 | 1662 | 1739 | 1815 | 1815 |
| | .16 | \$ 1495 | 1530 | 1572 | 1606 | 1641 | 1683 | 1718 | 1759 | 1794 | 1871 | 1947 | 1947 |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 952 | 1008 | 1064 | 1126 | 1182 | 1238 | 1293 | 1349 | 1405 | 1516 | 1627 | 1627 |
| | .06 | \$ 1008 | 1064 | 1119 | 1182 | 1238 | 1293 | 1349 | 1405 | 1460 | 1572 | 1683 | 1683 |
| | .07 | \$ 1071 | 1126 | 1182 | 1245 | 1300 | 1356 | 1412 | 1467 | 1523 | 1634 | 1745 | 1745 |
| | .08 | \$ 1126 | 1182 | 1238 | 1300 | 1356 | 1412 | 1467 | 1523 | 1579 | 1690 | 1801 | 1801 |
| | .09 | \$ 1182 | 1238 | 1293 | 1356 | 1412 | 1467 | 1523 | 1579 | 1634 | 1745 | 1857 | 1857 |
| | .10 | \$ 1238 | 1293 | 1349 | 1412 | 1467 | 1523 | 1579 | 1634 | 1690 | 1801 | 1912 | 1912 |
| | .12 | \$ 1356 | 1412 | 1467 | 1530 | 1586 | 1641 | 1697 | 1752 | 1808 | 1919 | 2031 | 2031 |
| | .14 | \$ 1467 | 1523 | 1579 | 1641 | 1697 | 1752 | 1808 | 1864 | 1919 | 2031 | 2142 | 2142 |
| | .16 | \$ 1586 | 1641 | 1697 | 1759 | 1815 | 1871 | 1926 | 1982 | 2038 | 2149 | 2260 | 2260 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16
 \$.60 .72 .84 .96 .108 .120 .144 .168 .192

<--ELECTRIC RATE \$/KWH
 <--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 36UHPOA 36UHPOA/A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 33000 SEER 8.69 INDOOR A36AO-A
 ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPP 6.90 MIN.DRR REG IV
 BTUH (17) 20000, COP(17) 2.20
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
BTUH ELEC.
COST
\$/KWH

35,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 605 | 1085 |
| .06 | \$ | 730 | 1300 |
| .07 | \$ | 848 | 1516 |
| .08 | \$ | 973 | 1732 |
| .09 | \$ | 1092 | 1947 |
| .10 | \$ | 1211 | 2170 |
| .12 | \$ | 1453 | 2601 |
| .14 | \$ | 1690 | 3039 |
| .16 | \$ | 1933 | 3471 |

BALANCE POINT 13 DEG.F.

40,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 695 | 1238 |
| .06 | \$ | 834 | 1488 |
| .07 | \$ | 973 | 1732 |
| .08 | \$ | 1112 | 1982 |
| .09 | \$ | 1259 | 2232 |
| .10 | \$ | 1391 | 2476 |
| .12 | \$ | 1669 | 2977 |
| .14 | \$ | 1947 | 3471 |
| .16 | \$ | 2225 | 3965 |

BALANCE POINT 16 DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 890 | 1544 |
| .06 | \$ | 1071 | 1857 |
| .07 | \$ | 1245 | 2170 |
| .08 | \$ | 1432 | 2476 |
| .09 | \$ | 1606 | 2789 |
| .10 | \$ | 1781 | 3095 |
| .12 | \$ | 2142 | 3721 |
| .14 | \$ | 2504 | 4340 |
| .16 | \$ | 2858 | 4959 |

BALANCE POINT 22 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1112 | 1857 |
| .06 | \$ | 1335 | 2232 |
| .07 | \$ | 1551 | 2601 |
| .08 | \$ | 1773 | 2977 |
| .09 | \$ | 1996 | 3345 |
| .10 | \$ | 2219 | 3721 |
| .12 | \$ | 2664 | 4465 |
| .14 | \$ | 3109 | 5210 |
| .16 | \$ | 3554 | 5954 |

BALANCE POINT 27 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1349 | 2170 |
| .06 | \$ | 1613 | 2601 |
| .07 | \$ | 1885 | 3039 |
| .08 | \$ | 2156 | 3471 |
| .09 | \$ | 2420 | 3902 |
| .10 | \$ | 2692 | 4340 |
| .12 | \$ | 3234 | 5210 |
| .14 | \$ | 3770 | 6079 |
| .16 | \$ | 4305 | 6942 |

BALANCE POINT 31 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
| | 75 | 91 | 106 | 121 | 136 | 151 | 182 | 212 | 243 |

-->ELECTRIC RATE \$/KWH
 -->THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 36UHP0A INDOOR A36AO-A
ARI RATED COOLING CAP.: BTUH(95) 33000 SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600 COP(47) 2.90, ESSP 6.90 MIN.DHR REG IV
BTUH (17) 20000, COP(17) 2.20
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|-------------------------|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 |
| | .05 | \$ 459 | 473 | 486 | 500 | 514 | 528 | 542 | 556 | 577 | 591 | 619 |
| | .06 | \$ 528 | 542 | 556 | 570 | 584 | 598 | 612 | 626 | 646 | 660 | 688 |
| | .07 | \$ 598 | 612 | 626 | 639 | 653 | 667 | 681 | 695 | 716 | 730 | 758 |
| | .08 | \$ 674 | 688 | 702 | 716 | 730 | 744 | 758 | 772 | 793 | 806 | 834 |
| | .09 | \$ 744 | 758 | 772 | 786 | 799 | 813 | 827 | 841 | 862 | 876 | 904 |
| | .10 | \$ 813 | 827 | 841 | 855 | 869 | 883 | 897 | 911 | 932 | 946 | 973 |
| | .12 | \$ 952 | 966 | 980 | 994 | 1008 | 1022 | 1036 | 1050 | 1071 | 1085 | 1112 |
| | .14 | \$ 1099 | 1112 | 1126 | 1140 | 1154 | 1168 | 1182 | 1196 | 1217 | 1231 | 1259 |
| | .16 | \$ 1238 | 1252 | 1266 | 1279 | 1293 | 1307 | 1321 | 1335 | 1356 | 1370 | 1398 |
| | | | | | | | | | | | | BALANCE POINT 13 DEG.F. |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 |
| | .05 | \$ 514 | 528 | 549 | 563 | 577 | 598 | 612 | 633 | 646 | 660 | 695 |
| | .06 | \$ 598 | 612 | 633 | 646 | 660 | 681 | 695 | 716 | 730 | 744 | 779 |
| | .07 | \$ 674 | 688 | 709 | 723 | 737 | 758 | 772 | 793 | 806 | 820 | 855 |
| | .08 | \$ 751 | 765 | 786 | 799 | 813 | 834 | 848 | 869 | 883 | 897 | 932 |
| | .09 | \$ 834 | 848 | 869 | 883 | 897 | 918 | 932 | 952 | 966 | 980 | 1015 |
| | .10 | \$ 911 | 925 | 946 | 959 | 973 | 994 | 1008 | 1029 | 1043 | 1057 | 1092 |
| | .12 | \$ 1071 | 1085 | 1106 | 1119 | 1133 | 1154 | 1168 | 1189 | 1203 | 1217 | 1252 |
| | .14 | \$ 1231 | 1245 | 1266 | 1279 | 1293 | 1314 | 1328 | 1349 | 1363 | 1377 | 1412 |
| | .16 | \$ 1391 | 1405 | 1426 | 1439 | 1453 | 1474 | 1488 | 1509 | 1523 | 1537 | 1572 |
| | | | | | | | | | | | | BALANCE POINT 16 DEG.F. |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 |
| | .05 | \$ 584 | 619 | 653 | 688 | 723 | 758 | 793 | 827 | 862 | 897 | 966 |
| | .06 | \$ 653 | 688 | 723 | 758 | 793 | 827 | 862 | 897 | 932 | 966 | 1036 |
| | .07 | \$ 723 | 758 | 793 | 827 | 862 | 897 | 932 | 966 | 1001 | 1036 | 1106 |
| | .08 | \$ 793 | 827 | 862 | 897 | 932 | 966 | 1001 | 1036 | 1071 | 1106 | 1175 |
| | .09 | \$ 855 | 890 | 925 | 959 | 994 | 1029 | 1064 | 1099 | 1133 | 1168 | 1238 |
| | .10 | \$ 925 | 959 | 994 | 1029 | 1064 | 1099 | 1133 | 1168 | 1203 | 1238 | 1300 |
| | .12 | \$ 1064 | 1099 | 1133 | 1168 | 1203 | 1238 | 1272 | 1307 | 1342 | 1377 | 1446 |
| | .14 | \$ 1203 | 1238 | 1272 | 1307 | 1342 | 1377 | 1412 | 1446 | 1481 | 1516 | 1586 |
| | .16 | \$ 1342 | 1377 | 1412 | 1446 | 1481 | 1516 | 1551 | 1586 | 1620 | 1655 | 1787 |
| | | | | | | | | | | | | BALANCE POINT 22 DEG.F. |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 |
| | .05 | \$ 660 | 709 | 765 | 813 | 862 | 918 | 966 | 1015 | 1071 | 1119 | 1224 |
| | .06 | \$ 723 | 772 | 827 | 876 | 925 | 980 | 1029 | 1078 | 1133 | 1182 | 1286 |
| | .07 | \$ 786 | 834 | 890 | 939 | 987 | 1043 | 1092 | 1140 | 1196 | 1245 | 1349 |
| | .08 | \$ 841 | 890 | 946 | 994 | 1043 | 1099 | 1147 | 1196 | 1252 | 1300 | 1405 |
| | .09 | \$ 904 | 952 | 1008 | 1057 | 1106 | 1161 | 1210 | 1259 | 1314 | 1363 | 1467 |
| | .10 | \$ 966 | 1015 | 1071 | 1119 | 1168 | 1224 | 1274 | 1321 | 1377 | 1426 | 1530 |
| | .12 | \$ 1092 | 1140 | 1196 | 1245 | 1293 | 1349 | 1398 | 1446 | 1502 | 1551 | 1655 |
| | .14 | \$ 1210 | 1259 | 1314 | 1363 | 1412 | 1467 | 1516 | 1565 | 1620 | 1669 | 1773 |
| | .16 | \$ 1335 | 1384 | 1439 | 1488 | 1537 | 1592 | 1641 | 1690 | 1745 | 1794 | 1899 |
| | | | | | | | | | | | | BALANCE POINT 27 DEG.F. |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 |
| | .05 | \$ 765 | 820 | 883 | 939 | 1001 | 1057 | 1119 | 1175 | 1238 | 1293 | 1419 |
| | .06 | \$ 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1245 | 1307 | 1363 | 1488 |
| | .07 | \$ 904 | 959 | 1022 | 1078 | 1140 | 1196 | 1259 | 1314 | 1377 | 1432 | 1558 |
| | .08 | \$ 973 | 1029 | 1092 | 1147 | 1210 | 1266 | 1328 | 1384 | 1446 | 1502 | 1627 |
| | .09 | \$ 1043 | 1099 | 1161 | 1217 | 1279 | 1335 | 1398 | 1453 | 1516 | 1572 | 1697 |
| | .10 | \$ 1112 | 1168 | 1231 | 1286 | 1349 | 1405 | 1467 | 1523 | 1586 | 1641 | 1766 |
| | .12 | \$ 1252 | 1307 | 1370 | 1426 | 1488 | 1544 | 1606 | 1662 | 1725 | 1780 | 1905 |
| | .14 | \$ 1391 | 1446 | 1509 | 1565 | 1627 | 1683 | 1745 | 1801 | 1864 | 1919 | 2045 |
| | .16 | \$ 1530 | 1586 | 1648 | 1704 | 1766 | 1822 | 1885 | 1940 | 2003 | 2059 | 2184 |
| | | | | | | | | | | | | BALANCE POINT 31 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

\$.05 .06 .07 .08 .09 .10 .12 .14 .16

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 36UHPOA INDOOR A36AO-A
ARI RATED COOLING CAP.: BTUH(95°) 33000 SEER 8.69
ARI RATED HEATING CAP.: BTUH (47°) 33600 COP(47°) 2.90, BHPF 6.90 MIN.DRR REG IV
BTUH (17°) 20000, COP(17°) 2.20
FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | KILO- COST S/KWH | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | HEATING OIL COST - \$/GALLON | |
|-------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------------|---|
| 35,000 | | | | | | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR |
| .06 | \$ 500 | 521 | 542 | 563 | 584 | 605 | 626 | 646 | 667 | 688 | 709 | 737 | | | |
| .07 | \$ 570 | 591 | 612 | 633 | 653 | 674 | 695 | 716 | 737 | 758 | 779 | 806 | | | |
| .08 | \$ 639 | 660 | 681 | 702 | 723 | 744 | 765 | 786 | 806 | 827 | 848 | 876 | | | |
| .09 | \$ 716 | 737 | 758 | 779 | 799 | 820 | 841 | 862 | 883 | 904 | 925 | 952 | | | |
| .10 | \$ 786 | 806 | 827 | 848 | 869 | 890 | 911 | 932 | 952 | 973 | 994 | 1022 | | | |
| .11 | \$ 855 | 876 | 897 | 918 | 939 | 959 | 980 | 1001 | 1022 | 1043 | 1064 | 1092 | | | |
| .12 | \$ 994 | 1015 | 1036 | 1057 | 1078 | 1099 | 1119 | 1140 | 1161 | 1182 | 1203 | 1231 | | | |
| .13 | \$ 1140 | 1161 | 1182 | 1203 | 1224 | 1245 | 1266 | 1286 | 1307 | 1328 | 1349 | 1377 | | | |
| .14 | \$ 1279 | 1300 | 1321 | 1342 | 1363 | 1384 | 1405 | 1426 | 1446 | 1467 | 1488 | 1516 | | | BALANCE POINT 13 DEG.F. |
| .15 | | | | | | | | | | | | | | | |
| .16 | \$ 1279 | 1300 | 1321 | 1342 | 1363 | 1384 | 1405 | 1426 | 1446 | 1467 | 1488 | 1516 | | | |
| 40,000 | | | | | | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR |
| .06 | \$ 563 | 591 | 612 | 639 | 660 | 688 | 709 | 730 | 758 | 779 | 806 | 827 | | | |
| .07 | \$ 646 | 674 | 695 | 723 | 744 | 772 | 793 | 813 | 841 | 862 | 890 | 911 | | | |
| .08 | \$ 723 | 751 | 772 | 799 | 820 | 848 | 869 | 890 | 918 | 939 | 966 | 987 | | | |
| .09 | \$ 799 | 827 | 848 | 876 | 897 | 925 | 946 | 966 | 994 | 1015 | 1043 | 1064 | | | |
| .10 | \$ 883 | 911 | 932 | 959 | 980 | 1008 | 1029 | 1050 | 1078 | 1099 | 1126 | 1147 | | | |
| .11 | \$ 959 | 981 | 1008 | 1036 | 1057 | 1085 | 1106 | 1126 | 1154 | 1175 | 1203 | 1224 | | | |
| .12 | \$ 1119 | 1147 | 1168 | 1196 | 1217 | 1245 | 1266 | 1286 | 1314 | 1335 | 1363 | 1384 | | | BALANCE POINT 16 DEG.F. |
| .13 | \$ 1279 | 1307 | 1328 | 1356 | 1377 | 1405 | 1426 | 1445 | 1474 | 1495 | 1523 | 1544 | | | |
| .14 | \$ 1439 | 1467 | 1488 | 1516 | 1537 | 1565 | 1586 | 1606 | 1634 | 1655 | 1683 | 1704 | | | |
| .15 | | | | | | | | | | | | | | | |
| .16 | \$ 1439 | 1467 | 1488 | 1516 | 1537 | 1565 | 1586 | 1606 | 1634 | 1655 | 1683 | 1704 | | | |
| 50,000 | | | | | | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR |
| .06 | \$ 695 | 744 | 793 | 841 | 890 | 939 | 987 | 1036 | 1085 | 1133 | 1189 | 1238 | | | |
| .07 | \$ 765 | 813 | 862 | 911 | 959 | 1008 | 1057 | 1106 | 1154 | 1203 | 1259 | 1307 | | | |
| .08 | \$ 834 | 883 | 932 | 980 | 1029 | 1078 | 1126 | 1175 | 1224 | 1272 | 1328 | 1377 | | | |
| .09 | \$ 904 | 952 | 1001 | 1050 | 1099 | 1147 | 1196 | 1245 | 1293 | 1342 | 1398 | 1446 | | | |
| .10 | \$ 966 | 1015 | 1064 | 1112 | 1161 | 1210 | 1259 | 1307 | 1354 | 1405 | 1460 | 1509 | | | |
| .11 | \$ 1036 | 1085 | 1133 | 1182 | 1231 | 1279 | 1328 | 1377 | 1426 | 1474 | 1530 | 1579 | | | |
| .12 | \$ 1175 | 1224 | 1272 | 1321 | 1370 | 1419 | 1467 | 1516 | 1565 | 1613 | 1669 | 1718 | | | |
| .13 | \$ 1314 | 1363 | 1412 | 1460 | 1509 | 1558 | 1606 | 1655 | 1704 | 1752 | 1808 | 1857 | | | BALANCE POINT 22 DEG.F. |
| .14 | \$ 1453 | 1502 | 1551 | 1599 | 1648 | 1697 | 1745 | 1794 | 1843 | 1892 | 1947 | 1996 | | | |
| .15 | | | | | | | | | | | | | | | |
| .16 | \$ 1453 | 1502 | 1551 | 1599 | 1648 | 1697 | 1745 | 1794 | 1843 | 1892 | 1947 | 1996 | | | |
| 60,000 | | | | | | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR |
| .06 | \$ 883 | 952 | 1029 | 1099 | 1175 | 1252 | 1321 | 1398 | 1467 | 1544 | 1613 | 1690 | | | |
| .07 | \$ 946 | 1015 | 1092 | 1161 | 1238 | 1314 | 1384 | 1460 | 1530 | 1606 | 1676 | 1752 | | | |
| .08 | \$ 1001 | 1071 | 1147 | 1217 | 1293 | 1370 | 1439 | 1516 | 1586 | 1662 | 1732 | 1808 | | | |
| .09 | \$ 1064 | 1133 | 1210 | 1279 | 1356 | 1432 | 1502 | 1579 | 1648 | 1725 | 1794 | 1871 | | | |
| .10 | \$ 1126 | 1196 | 1272 | 1342 | 1419 | 1495 | 1565 | 1641 | 1711 | 1787 | 1857 | 1933 | | | |
| .11 | \$ 1252 | 1321 | 1398 | 1467 | 1544 | 1620 | 1690 | 1766 | 1836 | 1912 | 1982 | 2059 | | | |
| .12 | \$ 1370 | 1439 | 1516 | 1586 | 1662 | 1739 | 1808 | 1885 | 1954 | 2031 | 2100 | 2177 | | | BALANCE POINT 27 DEG.F. |
| .13 | \$ 1495 | 1565 | 1641 | 1711 | 1787 | 1864 | 1933 | 2010 | 2079 | 2156 | 2225 | 2302 | | | |
| .14 | | | | | | | | | | | | | | | |
| .15 | \$ 1711 | 1794 | 1885 | 1968 | 2052 | 2142 | 2225 | 2309 | 2392 | 2483 | 2566 | 2650 | | | |
| .16 | | | | | | | | | | | | | | | |
| 70,000 | | | | | | | | | | | | | | | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 946 | 1029 | 1119 | 1203 | 1286 | 1377 | 1460 | 1544 | 1627 | 1718 | 1801 | 1885 | | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR |
| .06 | \$ 1015 | 1099 | 1189 | 1272 | 1356 | 1446 | 1530 | 1613 | 1697 | 1787 | 1871 | 1954 | | | |
| .07 | \$ 1085 | 1168 | 1259 | 1342 | 1426 | 1516 | 1599 | 1683 | 1766 | 1851 | 1940 | 2024 | | | |
| .08 | \$ 1154 | 1238 | 1328 | 1412 | 1495 | 1586 | 1669 | 1752 | 1836 | 1926 | 2010 | 2093 | | | |
| .09 | \$ 1224 | 1307 | 1398 | 1481 | 1565 | 1655 | 1739 | 1822 | 1905 | 1996 | 2079 | 2163 | | | |
| .10 | \$ 1293 | 1377 | 1467 | 1551 | 1634 | 1725 | 1808 | 1892 | 1975 | 2065 | 2149 | 2232 | | | |
| .11 | \$ 1432 | 1516 | 1606 | 1690 | 1773 | 1864 | 1947 | 2031 | 2114 | 2205 | 2288 | 2372 | | | |
| .12 | \$ 1572 | 1655 | 1745 | 1829 | 1912 | 2003 | 2086 | 2170 | 2253 | 2344 | 2427 | 2511 | | | |
| .13 | \$ 1711 | 1794 | 1885 | 1968 | 2052 | 2142 | 2225 | 2309 | 2392 | 2483 | 2566 | 2650 | | | |
| .14 | | | | | | | | | | | | | | | |
| .15 | | | | | | | | | | | | | | | |
| .16 | | | | | | | | | | | | | | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16

<--ELECTRIC RATE S/KWH
<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 36UHPOA INDOOR A36AO-A
ARI RATED COOLING CAP.: BTUH(95) 33000 SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600 COP(17) 2.90, RSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, COP(17) 2.20
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | KILO COST S/KWH | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
|------------------------------|-----------------------|------|------|------|------|------|------|------|------|------|------|------|--|
| PROPANE GAS COST - \$/GALLON | | | | | | | | | | | | | |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 549 | 563 | 577 | 598 | 612 | 626 | 646 | 660 | 674 | 709 | 737 | 737 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 619 | 633 | 646 | 667 | 681 | 695 | 716 | 730 | 744 | 779 | 806 | 806 | |
| .07 | \$ 688 | 702 | 716 | 737 | 751 | 765 | 786 | 799 | 813 | 848 | 876 | 876 | |
| .08 | \$ 765 | 779 | 793 | 813 | 827 | 841 | 862 | 876 | 890 | 925 | 952 | 952 | |
| .09 | \$ 834 | 848 | 862 | 883 | 897 | 911 | 932 | 946 | 959 | 994 | 1022 | 1022 | |
| .10 | \$ 904 | 918 | 932 | 952 | 966 | 980 | 1001 | 1015 | 1029 | 1064 | 1092 | 1092 | |
| .12 | \$ 1043 | 1057 | 1071 | 1092 | 1106 | 1119 | 1140 | 1154 | 1168 | 1203 | 1231 | 1231 | |
| .14 | \$ 1189 | 1203 | 1217 | 1238 | 1252 | 1266 | 1286 | 1300 | 1314 | 1349 | 1377 | 1377 | |
| .16 | \$ 1328 | 1342 | 1356 | 1377 | 1391 | 1405 | 1426 | 1439 | 1453 | 1488 | 1516 | 1516 | BALANCE POINT 13 DEG.F. |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 619 | 633 | 653 | 674 | 688 | 709 | 723 | 744 | 765 | 799 | 834 | 834 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 702 | 716 | 737 | 758 | 772 | 793 | 806 | 827 | 848 | 883 | 918 | 918 | |
| .07 | \$ 779 | 793 | 813 | 834 | 848 | 869 | 883 | 904 | 925 | 959 | 994 | 994 | |
| .08 | \$ 855 | 869 | 890 | 911 | 925 | 946 | 959 | 980 | 1001 | 1036 | 1071 | 1071 | |
| .09 | \$ 939 | 952 | 973 | 994 | 1008 | 1029 | 1043 | 1064 | 1085 | 1119 | 1154 | 1154 | |
| .10 | \$ 1015 | 1029 | 1050 | 1071 | 1085 | 1106 | 1119 | 1140 | 1161 | 1196 | 1231 | 1231 | |
| .12 | \$ 1175 | 1189 | 1210 | 1231 | 1245 | 1266 | 1279 | 1300 | 1321 | 1356 | 1391 | 1391 | |
| .14 | \$ 1335 | 1349 | 1370 | 1391 | 1405 | 1426 | 1439 | 1460 | 1481 | 1516 | 1551 | 1551 | |
| .16 | \$ 1495 | 1509 | 1530 | 1551 | 1565 | 1586 | 1599 | 1620 | 1641 | 1676 | 1711 | 1711 | BALANCE POINT 16 DEG.F. |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 799 | 834 | 876 | 911 | 946 | 987 | 1022 | 1064 | 1099 | 1175 | 1252 | 1252 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 869 | 904 | 946 | 980 | 1015 | 1057 | 1092 | 1133 | 1168 | 1245 | 1321 | 1321 | |
| .07 | \$ 939 | 973 | 1015 | 1050 | 1085 | 1126 | 1161 | 1203 | 1238 | 1314 | 1391 | 1391 | |
| .08 | \$ 1008 | 1043 | 1085 | 1119 | 1154 | 1196 | 1231 | 1272 | 1307 | 1384 | 1460 | 1460 | |
| .09 | \$ 1071 | 1106 | 1147 | 1182 | 1217 | 1259 | 1293 | 1335 | 1370 | 1446 | 1523 | 1523 | |
| .10 | \$ 1140 | 1175 | 1217 | 1252 | 1286 | 1328 | 1363 | 1405 | 1439 | 1516 | 1592 | 1592 | |
| .12 | \$ 1279 | 1314 | 1356 | 1391 | 1426 | 1467 | 1502 | 1544 | 1579 | 1655 | 1732 | 1732 | |
| .14 | \$ 1419 | 1453 | 1495 | 1530 | 1565 | 1606 | 1641 | 1683 | 1718 | 1794 | 1871 | 1871 | |
| .16 | \$ 1558 | 1592 | 1634 | 1669 | 1704 | 1745 | 1780 | 1822 | 1857 | 1933 | 2010 | 2010 | BALANCE POINT 22 DEG.F. |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 973 | 1029 | 1085 | 1147 | 1203 | 1259 | 1314 | 1370 | 1426 | 1537 | 1648 | 1648 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 1036 | 1092 | 1147 | 1210 | 1266 | 1321 | 1377 | 1432 | 1488 | 1599 | 1711 | 1711 | |
| .07 | \$ 1099 | 1154 | 1210 | 1272 | 1328 | 1384 | 1439 | 1495 | 1551 | 1662 | 1773 | 1773 | |
| .08 | \$ 1154 | 1210 | 1266 | 1328 | 1384 | 1439 | 1495 | 1551 | 1606 | 1718 | 1829 | 1829 | |
| .09 | \$ 1217 | 1272 | 1328 | 1391 | 1446 | 1502 | 1558 | 1613 | 1669 | 1784 | 1892 | 1892 | |
| .10 | \$ 1279 | 1335 | 1391 | 1453 | 1509 | 1565 | 1620 | 1676 | 1732 | 1843 | 1954 | 1954 | |
| .12 | \$ 1405 | 1460 | 1516 | 1579 | 1634 | 1690 | 1745 | 1801 | 1857 | 1968 | 2079 | 2079 | |
| .14 | \$ 1523 | 1579 | 1634 | 1697 | 1752 | 1808 | 1864 | 1919 | 1975 | 2086 | 2198 | 2198 | |
| .16 | \$ 1648 | 1704 | 1759 | 1822 | 1878 | 1933 | 1989 | 2045 | 2100 | 2212 | 2323 | 2323 | BALANCE POINT 27 DEG.F. |
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1126 | 1196 | 1259 | 1328 | 1391 | 1453 | 1523 | 1586 | 1648 | 1780 | 1912 | 1912 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 1196 | 1266 | 1328 | 1398 | 1460 | 1523 | 1592 | 1655 | 1718 | 1850 | 1982 | 1982 | |
| .07 | \$ 1266 | 1335 | 1398 | 1467 | 1530 | 1592 | 1662 | 1725 | 1787 | 1919 | 2052 | 2052 | |
| .08 | \$ 1335 | 1405 | 1467 | 1537 | 1599 | 1662 | 1732 | 1794 | 1857 | 1989 | 2121 | 2121 | |
| .09 | \$ 1405 | 1474 | 1537 | 1606 | 1669 | 1732 | 1801 | 1864 | 1926 | 2059 | 2191 | 2191 | |
| .10 | \$ 1474 | 1544 | 1606 | 1676 | 1739 | 1801 | 1871 | 1933 | 1996 | 2128 | 2260 | 2260 | |
| .12 | \$ 1613 | 1683 | 1745 | 1815 | 1878 | 1940 | 2010 | 2072 | 2135 | 2267 | 2399 | 2399 | |
| .14 | \$ 1752 | 1822 | 1885 | 1954 | 2017 | 2079 | 2149 | 2212 | 2274 | 2406 | 2538 | 2538 | |
| .16 | \$ 1892 | 1961 | 2024 | 2093 | 2156 | 2219 | 2288 | 2351 | 2413 | 2545 | 2678 | 2678 | BALANCE POINT 31 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

\$.05 .06 .07 .08 .09 .10 .12 .14 .16
 \$ 75 91 106 121 136 151 182 212 243

--ELECTRIC RATE S/KWH
 --THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 36UHPQA/A37AO-A
HEAT PUMP MODEL: OUTDOOR 36UHPQA INDOOR A37AO-A
ARI RATED COOLING CAP.: BTUH(95) 36000 SEER10.00
ARI RATED HEATING CAP.: BTUH (47) 36000 COP(47) 3.10, HSPF 7.20 MIN.DHR REG IV
BTUH (17) 21000 COP(17) 2.20
FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH ELBC. COST \$/KWH

40,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 660 | 1238 |
| .06 | \$ | 793 | 1488 |
| .07 | \$ | 932 | 1732 |
| .08 | \$ | 1057 | 1982 |
| .09 | \$ | 1189 | 2232 |
| .10 | \$ | 1328 | 2476 |
| .12 | \$ | 1592 | 2977 |
| .14 | \$ | 1850 | 3471 |
| .16 | \$ | 2121 | 3965 |

BALANCE POINT 15 DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 848 | 1544 |
| .06 | \$ | 1015 | 1857 |
| .07 | \$ | 1182 | 2170 |
| .08 | \$ | 1356 | 2476 |
| .09 | \$ | 1523 | 2789 |
| .10 | \$ | 1690 | 3095 |
| .12 | \$ | 2031 | 3721 |
| .14 | \$ | 2365 | 4340 |
| .16 | \$ | 2705 | 4959 |

BALANCE POINT 21 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1050 | 1857 |
| .06 | \$ | 1259 | 2232 |
| .07 | \$ | 1474 | 2601 |
| .08 | \$ | 1676 | 2977 |
| .09 | \$ | 1892 | 3345 |
| .10 | \$ | 2100 | 3721 |
| .12 | \$ | 2525 | 4465 |
| .14 | \$ | 2942 | 5210 |
| .16 | \$ | 3359 | 5954 |

BALANCE POINT 26 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1279 | 2170 |
| .06 | \$ | 1537 | 2601 |
| .07 | \$ | 1787 | 3039 |
| .08 | \$ | 2045 | 3471 |
| .09 | \$ | 2295 | 3902 |
| .10 | \$ | 2552 | 4340 |
| .12 | \$ | 3067 | 5210 |
| .14 | \$ | 3575 | 6079 |
| .16 | \$ | 4090 | 6942 |

BALANCE POINT 30 DEG.F.

80,000 --- THEORETICAL ANNUAL HEATING COST ---
HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1516 | 2476 |
| .06 | \$ | 1822 | 2977 |
| .07 | \$ | 2128 | 3471 |
| .08 | \$ | 2427 | 3965 |
| .09 | \$ | 2733 | 4465 |
| .10 | \$ | 3039 | 4959 |
| .12 | \$ | 3651 | 5954 |
| .14 | \$ | 4250 | 6942 |
| .16 | \$ | 4862 | 7936 |

BALANCE POINT 33 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

s .05 .06 .07 .08 .09 .10 .12 .14 .16
s 72 86 100 115 129 144 172 201 230

<-ELECTRIC RATE \$/KWH
<-THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| REGION 5 | | 36UHPOA/A37AO-A | | | | | | | | | | | | | | | |
|---|---------|---------------------------------|--------------------------|------|------|------|------|------|------|------|------|------|------|---|-------------------------|--|--|
| HEAT PUMP MODEL: OUTDOOR 36UHPOA INDOOR A37AO-A | | | | | | | | | | | | | | | | | |
| ARI RATED COOLING CAP.: BTUH(95°) 36000 SEER10.00 | | | | | | | | | | | | | | | | | |
| ARI RATED HEATING CAP.: BTUH (47°) 36000 COP(47°) 3.10, HSPE 7.20 MIN.DHR REG IV | | | | | | | | | | | | | | | | | |
| BTUH (17°) 21000 COP(17°) 2.20 | | HEAT LOSS BTUH | KILOC. COST \$/KWH | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 | | |
| FURNACE TYPE NATURAL GAS | | FURNACE EFFICIENCY 78.00 % AFUE | | | | | | | | | | | | | | | |
| 35,000 | | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 431 | 445 | 459 | 473 | 486 | 500 | 514 | 528 | 549 | 563 | 591 | 619 | | | | | |
| | \$ 493 | 507 | 521 | 535 | 549 | 563 | 577 | 591 | 612 | 626 | 653 | 681 | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | \$ 556 | 570 | 584 | 598 | 612 | 626 | 639 | 653 | 674 | 688 | 716 | 744 | | S PER YEAR | | | |
| | \$ 618 | 633 | 646 | 660 | 674 | 688 | 702 | 716 | 731 | 751 | 779 | 806 | | | | | |
| | \$ 688 | 702 | 716 | 730 | 744 | 758 | 772 | 786 | 806 | 820 | 848 | 876 | | 876 | | | |
| | \$ 751 | 765 | 779 | 793 | 806 | 820 | 834 | 848 | 869 | 883 | 911 | 939 | | | | | |
| | \$ 883 | 897 | 911 | 925 | 939 | 952 | 966 | 980 | 1001 | 1015 | 1043 | 1071 | | | | | |
| | \$ 1008 | 1022 | 1036 | 1050 | 1064 | 1078 | 1092 | 1106 | 1126 | 1140 | 1168 | 1196 | | | | | |
| | \$ 1140 | 1154 | 1168 | 1182 | 1196 | 1210 | 1224 | 1238 | 1259 | 1272 | 1300 | 1328 | | BALANCE POINT 12 DEG.F. | | | |
| .06 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | | <--THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | \$ 479 | 493 | 514 | 528 | 542 | 563 | 577 | 598 | 612 | 626 | 660 | 695 | | | | | |
| | \$ 556 | 570 | 591 | 605 | 619 | 639 | 653 | 674 | 688 | 702 | 737 | 772 | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | \$ 626 | 639 | 660 | 674 | 688 | 709 | 723 | 744 | 758 | 772 | 806 | 841 | | S PER YEAR | | | |
| | \$ 695 | 709 | 730 | 744 | 758 | 779 | 793 | 813 | 827 | 841 | 876 | 911 | | | | | |
| | \$ 772 | 786 | 806 | 820 | 834 | 855 | 869 | 890 | 904 | 918 | 952 | 987 | | | | | |
| | \$ 841 | 855 | 876 | 890 | 904 | 925 | 939 | 959 | 973 | 987 | 1022 | 1057 | | | | | |
| | \$ 987 | 1001 | 1022 | 1036 | 1050 | 1071 | 1085 | 1106 | 1119 | 1133 | 1168 | 1203 | | | | | |
| | \$ 1133 | 1147 | 1168 | 1182 | 1196 | 1217 | 1231 | 1252 | 1266 | 1279 | 1314 | 1349 | | BALANCE POINT 15 DEG.F. | | | |
| | \$ 1279 | 1293 | 1314 | 1328 | 1342 | 1363 | 1377 | 1398 | 1412 | 1426 | 1460 | 1495 | | | | | |
| .07 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | | <--THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | \$ 563 | 591 | 619 | 646 | 674 | 695 | 723 | 751 | 779 | 806 | 862 | 911 | | | | | |
| | \$ 639 | 667 | 695 | 723 | 751 | 772 | 799 | 827 | 855 | 883 | 939 | 987 | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | \$ 716 | 744 | 772 | 799 | 827 | 848 | 876 | 904 | 932 | 959 | 1015 | 1064 | | S PER YEAR | | | |
| | \$ 793 | 820 | 848 | 876 | 904 | 925 | 952 | 980 | 1008 | 1036 | 1092 | 1140 | | | | | |
| | \$ 862 | 890 | 918 | 946 | 973 | 994 | 1022 | 1050 | 1078 | 1106 | 1161 | 1210 | | | | | |
| | \$ 939 | 966 | 994 | 1022 | 1050 | 1071 | 1099 | 1126 | 1154 | 1182 | 1238 | 1286 | | | | | |
| | \$ 1092 | 1119 | 1147 | 1175 | 1203 | 1224 | 1252 | 1279 | 1307 | 1335 | 1391 | 1439 | | | | | |
| | \$ 1245 | 1272 | 1300 | 1328 | 1356 | 1377 | 1405 | 1432 | 1460 | 1488 | 1544 | 1592 | | BALANCE POINT 21 DEG.F. | | | |
| | \$ 1391 | 1419 | 1446 | 1474 | 1502 | 1523 | 1551 | 1579 | 1606 | 1634 | 1690 | 1739 | | | | | |
| .08 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | | <--THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | \$ 639 | 681 | 723 | 765 | 806 | 848 | 890 | 932 | 973 | 1008 | 1092 | 1175 | | | | | |
| | \$ 716 | 758 | 799 | 841 | 883 | 925 | 966 | 1008 | 1050 | 1085 | 1168 | 1252 | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | \$ 786 | 827 | 869 | 911 | 952 | 994 | 1036 | 1078 | 1119 | 1154 | 1238 | 1321 | | S PER YEAR | | | |
| | \$ 855 | 897 | 939 | 980 | 1022 | 1064 | 1106 | 1147 | 1189 | 1224 | 1307 | 1391 | | | | | |
| | \$ 925 | 966 | 1008 | 1050 | 1092 | 1133 | 1175 | 1217 | 1259 | 1293 | 1377 | 1460 | | | | | |
| | \$ 1001 | 1043 | 1085 | 1126 | 1168 | 1210 | 1252 | 1293 | 1335 | 1370 | 1453 | 1537 | | | | | |
| | \$ 1140 | 1182 | 1224 | 1266 | 1307 | 1349 | 1391 | 1432 | 1474 | 1509 | 1592 | 1676 | | | | | |
| | \$ 1286 | 1328 | 1370 | 1412 | 1453 | 1495 | 1537 | 1579 | 1620 | 1655 | 1739 | 1822 | | BALANCE POINT 26 DEG.F. | | | |
| | \$ 1426 | 1467 | 1509 | 1551 | 1592 | 1634 | 1676 | 1718 | 1759 | 1794 | 1878 | 1961 | | | | | |
| .09 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 | | <--THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | \$ 723 | 779 | 841 | 897 | 959 | 1015 | 1078 | 1133 | 1196 | 1252 | 1377 | 1495 | | | | | |
| | \$ 786 | 841 | 904 | 959 | 1022 | 1078 | 1140 | 1196 | 1259 | 1314 | 1439 | 1558 | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | \$ 841 | 897 | 959 | 1015 | 1078 | 1133 | 1196 | 1252 | 1314 | 1370 | 1495 | 1613 | | S PER YEAR | | | |
| | \$ 904 | 959 | 1022 | 1078 | 1140 | 1196 | 1259 | 1314 | 1377 | 1432 | 1558 | 1676 | | | | | |
| | \$ 966 | 1024 | 1085 | 1140 | 1203 | 1259 | 1321 | 1377 | 1439 | 1495 | 1620 | 1739 | | | | | |
| | \$ 1029 | 1085 | 1147 | 1203 | 1266 | 1321 | 1384 | 1439 | 1502 | 1558 | 1683 | 1801 | | | | | |
| | \$ 1147 | 1203 | 1266 | 1321 | 1384 | 1439 | 1502 | 1558 | 1620 | 1676 | 1801 | 1919 | | | | | |
| | \$ 1272 | 1328 | 1391 | 1446 | 1509 | 1565 | 1627 | 1683 | 1745 | 1801 | 1864 | 1919 | 2045 | | BALANCE POINT 30 DEG.F. | | |
| | \$ 1391 | 1446 | 1509 | 1565 | 1627 | 1683 | 1745 | 1801 | 1864 | 1919 | 2045 | 2163 | | | | | |
| .10 | \$ 758 | 862 | 973 | 1085 | 1189 | 1300 | 1405 | 1516 | 1627 | 1732 | 1947 | 2170 | | <--THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | \$ 799 | 876 | 959 | 1036 | 1119 | 1196 | 1279 | 1356 | 1439 | 1516 | 1676 | 1836 | | | | | |
| | \$ 848 | 925 | 1008 | 1085 | 1168 | 1245 | 1328 | 1405 | 1488 | 1565 | 1725 | 1885 | | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | \$ 897 | 973 | 1057 | 1133 | 1217 | 1293 | 1377 | 1453 | 1537 | 1613 | 1773 | 1933 | | S PER YEAR | | | |
| | \$ 946 | 1022 | 1106 | 1182 | 1266 | 1342 | 1426 | 1502 | 1586 | 1662 | 1822 | 1982 | | | | | |
| | \$ 994 | 1071 | 1154 | 1231 | 1314 | 1391 | 1474 | 1551 | 1634 | 1711 | 1871 | 2031 | | | | | |
| | \$ 1043 | 1119 | 1203 | 1279 | 1363 | 1439 | 1523 | 1599 | 1683 | 1759 | 1919 | 2079 | | | | | |
| | \$ 1133 | 1210 | 1293 | 1370 | 1453 | 1530 | 1613 | 1690 | 1773 | 1850 | 2010 | 2170 | | | | | |
| | \$ 1231 | 1307 | 1391 | 1467 | 1551 | 1627 | 1711 | 1787 | 1871 | 1947 | 2107 | 2267 | | BALANCE POINT 33 DEG.F. | | | |
| | \$ 1328 | 1405 | 1488 | 1565 | 1648 | 1725 | 1808 | 1885 | 1968 | 2045 | 2205 | 2365 | | | | | |
| ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP | | | | | | | | | | | | | | | | | |
| .05 .06 .07 .08 .09 .10 .12 .14 .16 | | | | | | | | | | | | | | | | | |
| <--ELECTRIC RATE \$/KWH | | | | | | | | | | | | | | | | | |
| THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN. | | | | | | | | | | | | | | | | | |

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 36UHPQA/A37AQ-A
 HEAT PUMP MODEL: OUTDOOR 36UHPQA INDOOR A37AQ-A
 ARI RATED COOLING CAP.: BTUH(95) 36000 SEER10.00
 ARI RATED HEATING CAP.: BTUH (47) 36000 COP(47) 3.10, HSPF 7.20 MIN.DER REG IV
 BTUH (17) 21000 COP(17) 2.20
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELBC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|---|--|--|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | | | |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 473 | 493 | 514 | 535 | 556 | 577 | 598 | 619 | 639 | 660 | 681 | 709 | | | |
| | .06 | \$ 535 | 556 | 577 | 598 | 619 | 639 | 660 | 681 | 702 | 723 | 744 | 772 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 598 | 619 | 639 | 660 | 681 | 702 | 723 | 744 | 765 | 786 | 806 | 834 | | | |
| | .08 | \$ 660 | 681 | 702 | 723 | 744 | 765 | 786 | 806 | 827 | 848 | 869 | 897 | | | |
| | .09 | \$ 730 | 751 | 772 | 793 | 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | | | |
| | .10 | \$ 793 | 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | 980 | 1001 | 1029 | BALANCE POINT 12 DEG.F. | | |
| | .12 | \$ 925 | 946 | 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1092 | 1112 | 1133 | 1161 | | | |
| | .14 | \$ 1050 | 1071 | 1092 | 1112 | 1133 | 1154 | 1175 | 1196 | 1217 | 1238 | 1259 | 1286 | | | |
| | .16 | \$ 1182 | 1203 | 1224 | 1245 | 1266 | 1286 | 1307 | 1328 | 1349 | 1370 | 1391 | 1419 | | | |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 528 | 556 | 577 | 605 | 626 | 653 | 674 | 695 | 723 | 744 | 772 | 793 | | | |
| | .06 | \$ 605 | 633 | 653 | 681 | 702 | 730 | 751 | 772 | 799 | 820 | 848 | 869 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 674 | 702 | 723 | 751 | 772 | 799 | 820 | 841 | 869 | 890 | 918 | 939 | | | |
| | .08 | \$ 744 | 772 | 793 | 820 | 841 | 869 | 890 | 911 | 939 | 959 | 987 | 1008 | | | |
| | .09 | \$ 820 | 848 | 869 | 897 | 918 | 946 | 966 | 987 | 1015 | 1036 | 1064 | 1085 | | | |
| | .10 | \$ 890 | 918 | 939 | 966 | 987 | 1015 | 1036 | 1057 | 1085 | 1106 | 1133 | 1154 | | | |
| | .12 | \$ 1036 | 1064 | 1085 | 1112 | 1133 | 1161 | 1182 | 1203 | 1231 | 1252 | 1279 | 1300 | BALANCE POINT 15 DEG.F. | | |
| | .14 | \$ 1182 | 1210 | 1231 | 1259 | 1279 | 1307 | 1328 | 1349 | 1377 | 1398 | 1426 | 1446 | | | |
| | .16 | \$ 1328 | 1356 | 1377 | 1405 | 1426 | 1453 | 1474 | 1495 | 1523 | 1544 | 1572 | 1592 | | | |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 646 | 688 | 723 | 765 | 799 | 841 | 883 | 918 | 959 | 994 | 1036 | 1071 | | | |
| | .06 | \$ 723 | 765 | 799 | 841 | 876 | 918 | 959 | 994 | 1036 | 1071 | 1112 | 1147 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 799 | 841 | 876 | 918 | 952 | 994 | 1036 | 1071 | 1112 | 1147 | 1189 | 1224 | | | |
| | .08 | \$ 876 | 918 | 952 | 994 | 1029 | 1071 | 1112 | 1147 | 1189 | 1224 | 1266 | 1300 | | | |
| | .09 | \$ 946 | 987 | 1022 | 1064 | 1099 | 1140 | 1182 | 1217 | 1259 | 1293 | 1335 | 1370 | | | |
| | .10 | \$ 1022 | 1064 | 1099 | 1140 | 1175 | 1217 | 1259 | 1293 | 1335 | 1370 | 1412 | 1446 | | | |
| | .12 | \$ 1175 | 1217 | 1259 | 1293 | 1328 | 1370 | 1412 | 1446 | 1488 | 1523 | 1565 | 1599 | BALANCE POINT 21 DEG.F. | | |
| | .14 | \$ 1328 | 1370 | 1405 | 1446 | 1481 | 1523 | 1565 | 1599 | 1641 | 1676 | 1718 | 1752 | | | |
| | .16 | \$ 1474 | 1516 | 1551 | 1592 | 1627 | 1669 | 1711 | 1745 | 1787 | 1822 | 1864 | 1899 | | | |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 772 | 827 | 890 | 946 | 1008 | 1064 | 1126 | 1182 | 1245 | 1300 | 1363 | 1419 | | | |
| | .06 | \$ 848 | 904 | 966 | 1022 | 1085 | 1140 | 1203 | 1259 | 1321 | 1377 | 1439 | 1495 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 918 | 973 | 1036 | 1092 | 1154 | 1210 | 1272 | 1328 | 1391 | 1446 | 1509 | 1565 | | | |
| | .08 | \$ 987 | 1043 | 1106 | 1161 | 1224 | 1279 | 1342 | 1398 | 1460 | 1516 | 1579 | 1634 | | | |
| | .09 | \$ 1057 | 1112 | 1175 | 1231 | 1293 | 1349 | 1412 | 1467 | 1530 | 1586 | 1648 | 1704 | | | |
| | .10 | \$ 1133 | 1189 | 1252 | 1307 | 1370 | 1426 | 1488 | 1544 | 1606 | 1662 | 1725 | 1780 | BALANCE POINT 26 DEG.F. | | |
| | .12 | \$ 1272 | 1328 | 1391 | 1446 | 1509 | 1565 | 1627 | 1683 | 1745 | 1801 | 1864 | 1919 | | | |
| | .14 | \$ 1419 | 1474 | 1537 | 1592 | 1655 | 1711 | 1773 | 1829 | 1892 | 1947 | 2010 | 2065 | | | |
| | .16 | \$ 1558 | 1613 | 1676 | 1732 | 1794 | 1850 | 1912 | 1968 | 2031 | 2086 | 2149 | 2205 | | | |
| 70,000 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 904 | 987 | 1078 | 1161 | 1245 | 1335 | 1419 | 1502 | 1586 | 1676 | 1759 | 1843 | | | |
| | .06 | \$ 966 | 1050 | 1140 | 1224 | 1307 | 1398 | 1481 | 1565 | 1648 | 1739 | 1822 | 1905 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 1022 | 1106 | 1196 | 1279 | 1363 | 1453 | 1537 | 1620 | 1704 | 1794 | 1878 | 1961 | | | |
| | .08 | \$ 1085 | 1168 | 1259 | 1342 | 1426 | 1516 | 1599 | 1683 | 1766 | 1857 | 1940 | 2024 | | | |
| | .09 | \$ 1147 | 1231 | 1405 | 1488 | 1579 | 1662 | 1745 | 1829 | 1919 | 2003 | 2086 | | | | |
| | .10 | \$ 1210 | 1293 | 1384 | 1467 | 1551 | 1641 | 1725 | 1808 | 1892 | 1982 | 2065 | 2149 | BALANCE POINT 30 DEG.F. | | |
| | .12 | \$ 1328 | 1412 | 1502 | 1586 | 1669 | 1759 | 1843 | 1926 | 2010 | 2100 | 2184 | 2267 | | | |
| | .14 | \$ 1453 | 1537 | 1627 | 1711 | 1794 | 1885 | 1968 | 2052 | 2135 | 2225 | 2309 | 2392 | | | |
| | .16 | \$ 1572 | 1655 | 1745 | 1829 | 1912 | 2003 | 2086 | 2170 | 2253 | 2344 | 2427 | 2511 | | | |
| 80,000 | \$ 1092 | 1252 | 1405 | 1565 | 1718 | 1878 | 2031 | 2191 | 2344 | 2504 | 2657 | 2817 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 1043 | 1161 | 1272 | 1391 | 1509 | 1620 | 1739 | 1857 | 1968 | 2086 | 2198 | 2316 | | | |
| | .06 | \$ 1092 | 1210 | 1321 | 1439 | 1558 | 1669 | 1787 | 1905 | 2017 | 2135 | 2246 | 2365 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP S PER YEAR | | |
| | .07 | \$ 1140 | 1259 | 1370 | 1488 | 1606 | 1718 | 1836 | 1954 | 2065 | 2184 | 2295 | 2413 | | | |
| | .08 | \$ 1189 | 1307 | 1419 | 1537 | 1655 | 1766 | 1885 | 2003 | 2114 | 2232 | 2344 | 2462 | | | |
| | .09 | \$ 1238 | 1356 | 1467 | 1584 | 1704 | 1815 | 1933 | 2052 | 2163 | 2281 | 2392 | 2511 | | | |
| | .10 | \$ 1286 | 1405 | 1516 | 1634 | 1752 | 1864 | 1982 | 2100 | 2212 | 2330 | 2441 | 2559 | | | |
| | .12 | \$ 1377 | 1495 | 1606 | 1725 | 1843 | 1954 | 2072 | 2191 | 2302 | 2420 | 2532 | 2650 | | | |
| | .14 | \$ 1474 | 1592 | 1704 | 1822 | 1940 | 2052 | 2170 | 2289 | 2399 | 2518 | 2629 | 2747 | BALANCE POINT 33 DEG.F. | | |
| | .16 | \$ 1572 | 1690 | 1801 | 1919 | 2038 | 2149 | 2267 | 2385 | 2497 | 2615 | 2726 | 2845 | | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

85 86 87 88 89 10 12 14 16

<--ELECTRIC RATE S/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 36UHPOA/A37AO-A
HEAT PUMP MODEL: OUTDOOR 36UHPOA INDOOR A37AO-A
ARI RATED COOLING CAP.: BTUH(95°) 36000 **SEER10.00**
ARI RATED HEATING CAP.: BTUH (47°) 36000 **COP(47°)** 3.10 **HSPP** 7.20 **MIN.DER REG IV**
BTUH (17°) 21000 **COP(17°)** 2.20 **FURNACE TYPE** PROPANE GAS **FURNACE EFFICIENCY** 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST S/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | |
|-------------------|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|--|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.20 |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 521 | 535 | 549 | 570 | 584 | 598 | 619 | 633 | 646 | 681 | 709 | 709 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 584 | 598 | 612 | 633 | 646 | 660 | 681 | 695 | 709 | 744 | 772 | 772 | |
| .07 | \$ 646 | 660 | 674 | 695 | 709 | 723 | 744 | 758 | 772 | 806 | 834 | 834 | |
| .08 | \$ 709 | 723 | 737 | 758 | 772 | 786 | 806 | 820 | 834 | 869 | 897 | 897 | |
| .09 | \$ 772 | 786 | 806 | 827 | 841 | 855 | 876 | 890 | 904 | 939 | 966 | 966 | |
| .10 | \$ 841 | 855 | 869 | 890 | 904 | 918 | 939 | 952 | 966 | 1001 | 1029 | 1029 | |
| .12 | \$ 973 | 987 | 1001 | 1022 | 1036 | 1050 | 1071 | 1085 | 1099 | 1133 | 1161 | 1161 | |
| .14 | \$ 1099 | 1112 | 1126 | 1147 | 1161 | 1175 | 1196 | 1210 | 1224 | 1259 | 1286 | 1286 | |
| .16 | \$ 1231 | 1245 | 1259 | 1279 | 1293 | 1307 | 1328 | 1342 | 1356 | 1391 | 1419 | 1419 | BALANCE POINT 12 DEG.F. |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 584 | 598 | 619 | 639 | 653 | 674 | 688 | 709 | 730 | 765 | 799 | 799 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 660 | 674 | 695 | 716 | 730 | 751 | 765 | 786 | 806 | 841 | 876 | 876 | |
| .07 | \$ 730 | 744 | 765 | 786 | 799 | 820 | 834 | 855 | 876 | 911 | 946 | 946 | |
| .08 | \$ 799 | 813 | 834 | 855 | 869 | 890 | 904 | 925 | 946 | 980 | 1015 | 1015 | |
| .09 | \$ 876 | 890 | 911 | 932 | 946 | 966 | 980 | 1001 | 1022 | 1057 | 1092 | 1092 | |
| .10 | \$ 946 | 959 | 980 | 1001 | 1015 | 1036 | 1050 | 1071 | 1092 | 1126 | 1161 | 1161 | |
| .12 | \$ 1092 | 1106 | 1126 | 1147 | 1161 | 1182 | 1196 | 1217 | 1238 | 1272 | 1307 | 1307 | |
| .14 | \$ 1238 | 1252 | 1272 | 1293 | 1307 | 1328 | 1342 | 1363 | 1384 | 1419 | 1453 | 1453 | BALANCE POINT 15 DEG.F. |
| .16 | \$ 1384 | 1398 | 1419 | 1439 | 1453 | 1474 | 1488 | 1509 | 1530 | 1565 | 1599 | 1599 | |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 730 | 758 | 793 | 820 | 848 | 876 | 911 | 939 | 966 | 1029 | 1085 | 1085 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 806 | 834 | 869 | 897 | 925 | 952 | 987 | 1015 | 1043 | 1106 | 1161 | 1161 | |
| .07 | \$ 883 | 911 | 946 | 973 | 1001 | 1029 | 1064 | 1092 | 1119 | 1182 | 1238 | 1238 | |
| .08 | \$ 959 | 987 | 1022 | 1050 | 1078 | 1106 | 1140 | 1168 | 1196 | 1259 | 1314 | 1314 | |
| .09 | \$ 1029 | 1059 | 1102 | 1129 | 1150 | 1178 | 1210 | 1238 | 1266 | 1328 | 1384 | 1384 | |
| .10 | \$ 1106 | 1133 | 1168 | 1196 | 1224 | 1252 | 1284 | 1314 | 1342 | 1405 | 1460 | 1460 | |
| .12 | \$ 1259 | 1286 | 1321 | 1349 | 1377 | 1405 | 1439 | 1467 | 1495 | 1558 | 1613 | 1613 | |
| .14 | \$ 1412 | 1439 | 1474 | 1502 | 1530 | 1558 | 1592 | 1620 | 1648 | 1711 | 1766 | 1766 | BALANCE POINT 21 DEG.F. |
| .16 | \$ 1558 | 1586 | 1620 | 1648 | 1676 | 1704 | 1739 | 1766 | 1794 | 1857 | 1912 | 1912 | |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 897 | 939 | 987 | 1029 | 1078 | 1119 | 1168 | 1210 | 1259 | 1349 | 1439 | 1439 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 973 | 1015 | 1064 | 1106 | 1154 | 1196 | 1245 | 1286 | 1335 | 1426 | 1516 | 1516 | |
| .07 | \$ 1043 | 1085 | 1133 | 1175 | 1224 | 1266 | 1314 | 1356 | 1405 | 1495 | 1586 | 1586 | |
| .08 | \$ 1112 | 1154 | 1203 | 1245 | 1293 | 1335 | 1384 | 1426 | 1474 | 1565 | 1655 | 1655 | |
| .09 | \$ 1182 | 1224 | 1272 | 1314 | 1363 | 1405 | 1453 | 1495 | 1544 | 1634 | 1725 | 1725 | |
| .10 | \$ 1259 | 1300 | 1349 | 1391 | 1439 | 1481 | 1530 | 1572 | 1620 | 1711 | 1801 | 1801 | |
| .12 | \$ 1398 | 1439 | 1488 | 1530 | 1579 | 1620 | 1669 | 1711 | 1759 | 1850 | 1940 | 1940 | |
| .14 | \$ 1544 | 1586 | 1634 | 1676 | 1725 | 1766 | 1815 | 1857 | 1905 | 1996 | 2086 | 2086 | BALANCE POINT 26 DEG.F. |
| .16 | \$ 1683 | 1725 | 1773 | 1815 | 1864 | 1905 | 1954 | 1996 | 2045 | 2135 | 2225 | 2225 | |
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1085 | 1154 | 1217 | 1286 | 1349 | 1412 | 1481 | 1544 | 1606 | 1739 | 1871 | 1871 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 1147 | 1217 | 1279 | 1349 | 1412 | 1474 | 1544 | 1606 | 1669 | 1801 | 1933 | 1933 | |
| .07 | \$ 1203 | 1272 | 1335 | 1405 | 1467 | 1530 | 1599 | 1662 | 1725 | 1857 | 1989 | 1989 | |
| .08 | \$ 1266 | 1335 | 1398 | 1467 | 1530 | 1592 | 1662 | 1725 | 1787 | 1919 | 2052 | 2052 | |
| .09 | \$ 1328 | 1398 | 1460 | 1530 | 1592 | 1655 | 1725 | 1787 | 1850 | 1982 | 2114 | 2114 | |
| .10 | \$ 1391 | 1460 | 1523 | 1592 | 1655 | 1718 | 1787 | 1850 | 1912 | 2045 | 2177 | 2177 | |
| .12 | \$ 1509 | 1579 | 1641 | 1711 | 1773 | 1836 | 1905 | 1968 | 2031 | 2163 | 2295 | 2295 | |
| .14 | \$ 1634 | 1704 | 1766 | 1836 | 1899 | 1961 | 2031 | 2093 | 2156 | 2288 | 2420 | 2420 | |
| .16 | \$ 1752 | 1822 | 1885 | 1954 | 2017 | 2079 | 2149 | 2212 | 2274 | 2406 | 2538 | 2538 | BALANCE POINT 30 DEG.F. |
| 80,000 | \$ 1426 | 1551 | 1669 | 1787 | 1905 | 2024 | 2142 | 2260 | 2385 | 2622 | 2858 | 2858 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1293 | 1384 | 1467 | 1558 | 1648 | 1732 | 1822 | 1912 | 1996 | 2170 | 2351 | 2351 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR |
| .06 | \$ 1342 | 1432 | 1516 | 1606 | 1697 | 1780 | 1871 | 1961 | 2045 | 2219 | 2399 | 2399 | |
| .07 | \$ 1391 | 1481 | 1565 | 1655 | 1745 | 1829 | 1919 | 2010 | 2093 | 2267 | 2448 | 2448 | |
| .08 | \$ 1439 | 1530 | 1613 | 1704 | 1794 | 1878 | 1968 | 2059 | 2142 | 2316 | 2497 | 2497 | |
| .09 | \$ 1488 | 1579 | 1662 | 1752 | 1843 | 1926 | 2017 | 2107 | 2191 | 2365 | 2545 | 2545 | |
| .10 | \$ 1537 | 1627 | 1711 | 1801 | 1892 | 1975 | 2065 | 2156 | 2239 | 2413 | 2594 | 2594 | |
| .12 | \$ 1627 | 1718 | 1801 | 1892 | 1982 | 2065 | 2156 | 2246 | 2330 | 2504 | 2685 | 2685 | |
| .14 | \$ 1725 | 1815 | 1899 | 1989 | 2079 | 2163 | 2253 | 2344 | 2427 | 2601 | 2782 | 2782 | |
| .16 | \$ 1822 | 1912 | 1996 | 2086 | 2177 | 2260 | 2351 | 2441 | 2525 | 2698 | 2879 | 2879 | BALANCE POINT 33 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16 --ELECTRIC RATE \$/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 36UHPQA INDOOR A42AS-A
 ARI RATED COOLING CAP.: BTUH(95) 33400 SEER 9.30
 ARI RATED HEATING CAP.: BTUH (47) 34800 COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
 BTUH (17) 20400, COP(17) 2.00
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
BTUH ELECTRIC COST
S/KWH

40,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 716 | 1238 |
| .06 | S | 855 | 1488 |
| .07 | S | 1001 | 1732 |
| .08 | S | 1140 | 1982 |
| .09 | S | 1286 | 2232 |
| .10 | S | 1432 | 2476 |
| .12 | S | 1718 | 2977 |
| .14 | S | 2003 | 3471 |
| .16 | S | 2295 | 3965 |

BALANCE POINT 16 DEG.F.

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 911 | 1544 |
| .06 | S | 1092 | 1857 |
| .07 | S | 1272 | 2170 |
| .08 | S | 1453 | 2476 |
| .09 | S | 1641 | 2789 |
| .10 | S | 1822 | 3095 |
| .12 | S | 2184 | 3721 |
| .14 | S | 2552 | 4340 |
| .16 | S | 2914 | 4959 |

BALANCE POINT 22 DEG. F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1126 | 1857 |
| .06 | S | 1349 | 2232 |
| .07 | S | 1572 | 2601 |
| .08 | S | 1801 | 2977 |
| .09 | S | 2024 | 3345 |
| .10 | S | 2246 | 3721 |
| .12 | S | 2698 | 4465 |
| .14 | S | 3151 | 5210 |
| .16 | S | 3596 | 5954 |

BALANCE POINT 27 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1363 | 2170 |
| .06 | S | 1627 | 2601 |
| .07 | S | 1905 | 3039 |
| .08 | S | 2170 | 3471 |
| .09 | S | 2448 | 3902 |
| .10 | S | 2712 | 4340 |
| .12 | S | 3262 | 5210 |
| .14 | S | 3805 | 6079 |
| .16 | S | 4347 | 6942 |

BALANCE POINT 31 DEG.F.

80,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1613 | 2476 |
| .06 | S | 1926 | 2977 |
| .07 | S | 2253 | 3471 |
| .08 | S | 2573 | 3965 |
| .09 | S | 2893 | 4465 |
| .10 | S | 3220 | 4959 |
| .12 | S | 3867 | 5954 |
| .14 | S | 4507 | 6942 |
| .16 | S | 5147 | 7936 |

BALANCE POINT 34 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
| | 71 | 86 | 100 | 114 | 129 | 143 | 172 | 201 | 229 |

<<--ELECTRIC RATE S/KWH
 <<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 36UHPQA/A42AS-A
 HEAT PUMP MODEL: OUTDOOR 36UHPQA INDOOR A42AS-A
 ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30
 ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, RSPF 7.00 MIN.DHR REG IV
 BTUH (17) 20400, COP(17) 2.00
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | KLRG. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 |
| 35,000 | \$ 326 | 375 | 424 | 473 | 521 | 563 | 612 | 660 | 709 | 758 | 848 | 946 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 466 | 479 | 493 | 507 | 521 | 535 | 549 | 563 | 584 | 598 | 626 | 653 |
| | .06 | \$ 535 | 549 | 563 | 577 | 591 | 605 | 619 | 633 | 653 | 667 | 695 | 723 |
| | .07 | \$ 605 | 619 | 633 | 646 | 660 | 674 | 688 | 702 | 723 | 737 | 765 | 793 |
| | .08 | \$ 681 | 695 | 709 | 723 | 737 | 751 | 765 | 779 | 799 | 813 | 841 | 869 |
| | .09 | \$ 751 | 765 | 779 | 793 | 806 | 820 | 834 | 848 | 869 | 883 | 911 | 939 |
| | .10 | \$ 820 | 834 | 848 | 862 | 876 | 890 | 904 | 918 | 939 | 952 | 980 | 1008 |
| | .12 | \$ 966 | 980 | 994 | 1008 | 1022 | 1036 | 1050 | 1064 | 1085 | 1099 | 1126 | 1154 |
| | .14 | \$ 1112 | 1126 | 1140 | 1154 | 1168 | 1182 | 1196 | 1210 | 1231 | 1245 | 1272 | 1300 |
| | .16 | \$ 1252 | 1266 | 1279 | 1293 | 1307 | 1321 | 1335 | 1349 | 1370 | 1384 | 1412 | 1439 |
| | | | | | | | | | | | | | BALANCE POINT 13 DEG.F. |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 521 | 535 | 556 | 570 | 584 | 605 | 619 | 639 | 653 | 667 | 702 | 737 |
| | .06 | \$ 598 | 612 | 633 | 646 | 660 | 681 | 695 | 716 | 730 | 744 | 779 | 813 |
| | .07 | \$ 681 | 695 | 716 | 730 | 744 | 765 | 779 | 799 | 813 | 827 | 862 | 897 |
| | .08 | \$ 765 | 779 | 793 | 813 | 827 | 848 | 862 | 883 | 897 | 911 | 946 | 980 |
| | .09 | \$ 841 | 855 | 876 | 890 | 904 | 925 | 939 | 959 | 973 | 987 | 1022 | 1057 |
| | .10 | \$ 925 | 939 | 959 | 973 | 981 | 1008 | 1022 | 1043 | 1057 | 1071 | 1106 | 1140 |
| | .12 | \$ 1085 | 1099 | 1119 | 1133 | 1147 | 1168 | 1182 | 1203 | 1217 | 1231 | 1266 | 1300 |
| | .14 | \$ 1245 | 1259 | 1279 | 1293 | 1307 | 1328 | 1342 | 1363 | 1377 | 1391 | 1426 | 1460 |
| | .16 | \$ 1405 | 1419 | 1439 | 1453 | 1467 | 1488 | 1502 | 1523 | 1537 | 1551 | 1586 | 1620 |
| | | | | | | | | | | | | | BALANCE POINT 16 DEG.F. |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 577 | 612 | 646 | 681 | 716 | 751 | 786 | 820 | 855 | 890 | 959 | 1022 |
| | .06 | \$ 646 | 681 | 716 | 751 | 786 | 820 | 855 | 890 | 925 | 959 | 1029 | 1092 |
| | .07 | \$ 709 | 744 | 779 | 813 | 848 | 883 | 918 | 952 | 987 | 1022 | 1092 | 1154 |
| | .08 | \$ 779 | 813 | 848 | 883 | 918 | 952 | 987 | 1022 | 1057 | 1092 | 1161 | 1224 |
| | .09 | \$ 848 | 883 | 918 | 952 | 987 | 1022 | 1057 | 1092 | 1126 | 1161 | 1231 | 1293 |
| | .10 | \$ 918 | 952 | 987 | 1022 | 1057 | 1092 | 1126 | 1161 | 1196 | 1231 | 1300 | 1363 |
| | .12 | \$ 1050 | 1085 | 1119 | 1154 | 1189 | 1224 | 1259 | 1293 | 1328 | 1363 | 1432 | 1495 |
| | .14 | \$ 1189 | 1224 | 1259 | 1293 | 1328 | 1363 | 1398 | 1432 | 1467 | 1502 | 1572 | 1634 |
| | .16 | \$ 1328 | 1363 | 1398 | 1432 | 1467 | 1502 | 1537 | 1572 | 1606 | 1641 | 1711 | 1773 |
| | | | | | | | | | | | | | BALANCE POINT 22 DEG.F. |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 653 | 702 | 758 | 806 | 855 | 911 | 959 | 1008 | 1064 | 1112 | 1217 | 1314 |
| | .06 | \$ 709 | 758 | 813 | 862 | 911 | 966 | 1015 | 1064 | 1119 | 1168 | 1272 | 1370 |
| | .07 | \$ 777 | 820 | 876 | 925 | 973 | 1029 | 1078 | 1126 | 1182 | 1231 | 1335 | 1432 |
| | .08 | \$ 827 | 876 | 932 | 980 | 1029 | 1085 | 1133 | 1182 | 1238 | 1286 | 1391 | 1488 |
| | .09 | \$ 890 | 939 | 994 | 1043 | 1092 | 1147 | 1196 | 1245 | 1300 | 1349 | 1453 | 1551 |
| | .10 | \$ 946 | 994 | 1050 | 1099 | 1147 | 1203 | 1252 | 1300 | 1356 | 1405 | 1509 | 1606 |
| | .12 | \$ 1064 | 1112 | 1168 | 1217 | 1266 | 1321 | 1370 | 1419 | 1474 | 1523 | 1627 | 1725 |
| | .14 | \$ 1182 | 1231 | 1286 | 1335 | 1384 | 1439 | 1488 | 1537 | 1592 | 1641 | 1745 | 1843 |
| | .16 | \$ 1307 | 1356 | 1412 | 1460 | 1509 | 1565 | 1613 | 1662 | 1718 | 1766 | 1871 | 1968 |
| | | | | | | | | | | | | | BALANCE POINT 27 DEG.F. |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 758 | 813 | 876 | 932 | 994 | 1050 | 1112 | 1168 | 1231 | 1286 | 1412 | 1530 |
| | .06 | \$ 820 | 876 | 939 | 994 | 1057 | 1112 | 1175 | 1231 | 1293 | 1349 | 1474 | 1592 |
| | .07 | \$ 890 | 946 | 1008 | 1064 | 1126 | 1182 | 1245 | 1300 | 1363 | 1419 | 1544 | 1662 |
| | .08 | \$ 959 | 1015 | 1078 | 1133 | 1196 | 1252 | 1314 | 1370 | 1432 | 1488 | 1613 | 1732 |
| | .09 | \$ 1022 | 1078 | 1140 | 1196 | 1259 | 1314 | 1377 | 1432 | 1495 | 1551 | 1676 | 1794 |
| | .10 | \$ 1092 | 1147 | 1210 | 1266 | 1328 | 1384 | 1446 | 1502 | 1565 | 1620 | 1745 | 1864 |
| | .12 | \$ 1224 | 1279 | 1314 | 1362 | 1460 | 1516 | 1579 | 1634 | 1697 | 1752 | 1878 | 1996 |
| | .14 | \$ 1363 | 1419 | 1481 | 1537 | 1599 | 1655 | 1718 | 1773 | 1836 | 1892 | 2017 | 2135 |
| | .16 | \$ 1495 | 1551 | 1613 | 1669 | 1732 | 1787 | 1850 | 1905 | 1968 | 2024 | 2149 | 2267 |
| | | | | | | | | | | | | | BALANCE POINT 31 DEG.F. |
| 80,000 | \$ 758 | 862 | 973 | 1085 | 1189 | 1300 | 1405 | 1516 | 1627 | 1732 | 1947 | 2170 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 827 | 904 | 987 | 1064 | 1147 | 1224 | 1307 | 1384 | 1467 | 1544 | 1704 | 1864 |
| | .06 | \$ 876 | 952 | 1036 | 1112 | 1196 | 1272 | 1356 | 1432 | 1516 | 1592 | 1752 | 1912 |
| | .07 | \$ 932 | 1008 | 1092 | 1168 | 1252 | 1328 | 1412 | 1488 | 1572 | 1648 | 1808 | 1968 |
| | .08 | \$ 980 | 1057 | 1140 | 1217 | 1300 | 1377 | 1460 | 1537 | 1620 | 1697 | 1857 | 2017 |
| | .09 | \$ 1036 | 1112 | 1186 | 1272 | 1356 | 1432 | 1516 | 1592 | 1676 | 1752 | 1912 | 2072 |
| | .10 | \$ 1085 | 1161 | 1245 | 1321 | 1405 | 1481 | 1565 | 1641 | 1725 | 1801 | 1961 | 2121 |
| | .12 | \$ 1189 | 1266 | 1349 | 1426 | 1509 | 1586 | 1669 | 1745 | 1829 | 1905 | 2065 | 2225 |
| | .14 | \$ 1293 | 1370 | 1453 | 1530 | 1613 | 1690 | 1773 | 1850 | 1933 | 2010 | 2170 | 2330 |
| | .16 | \$ 1398 | 1474 | 1558 | 1634 | 1718 | 1794 | 1878 | 1954 | 2038 | 2114 | 2274 | 2434 |
| | | | | | | | | | | | | | BALANCE POINT 34 DEG.F. |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

05 06 07 08 09 10 12 14 16 <--ELECTRIC RATE \$/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 36UHPOA INDOOR A42AS-A
 ARI RATED COOLING CAP.: BTUH(95) 33400 SEER 9.30
 ARI RATED HEATING CAP.: BTUH (47) 34800 COP(47) 3.00, BHPF 7.00 MIN.DHR REG IV
 BTUH (17) 20400 COP(17) 2.00
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | |
|-------------------|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 |
| 35,000 | \$ 473 | 542 | 612 | 681 | 751 | 820 | 890 | 952 | 1022 | 1092 | 1161 | 1231 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 507 | 528 | 549 | 570 | 591 | 612 | 633 | 653 | 674 | 695 | 716 | 744 |
| | .06 | \$ 577 | 598 | 619 | 639 | 660 | 681 | 702 | 723 | 744 | 765 | 786 | 813 |
| | .07 | \$ 646 | 667 | 688 | 709 | 730 | 751 | 772 | 793 | 813 | 834 | 855 | 883 |
| | .08 | \$ 723 | 744 | 765 | 786 | 806 | 827 | 848 | 869 | 890 | 911 | 932 | 959 |
| | .09 | \$ 793 | 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | 980 | 1001 | 1029 |
| | .10 | \$ 862 | 883 | 904 | 925 | 946 | 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1099 |
| | .12 | \$ 1008 | 1029 | 1050 | 1071 | 1092 | 1112 | 1133 | 1154 | 1175 | 1196 | 1217 | 1245 |
| | .14 | \$ 1154 | 1175 | 1196 | 1217 | 1238 | 1259 | 1279 | 1300 | 1321 | 1342 | 1363 | 1391 |
| | .16 | \$ 1293 | 1314 | 1335 | 1356 | 1377 | 1398 | 1419 | 1439 | 1460 | 1481 | 1502 | 1530 |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 570 | 598 | 619 | 646 | 667 | 695 | 716 | 737 | 765 | 786 | 813 | 834 |
| | .06 | \$ 646 | 674 | 695 | 723 | 744 | 772 | 793 | 813 | 841 | 862 | 890 | 911 |
| | .07 | \$ 730 | 758 | 779 | 806 | 827 | 855 | 876 | 897 | 925 | 946 | 973 | 994 |
| | .08 | \$ 813 | 841 | 862 | 890 | 911 | 939 | 959 | 980 | 1008 | 1029 | 1057 | 1078 |
| | .09 | \$ 890 | 918 | 939 | 966 | 987 | 1015 | 1036 | 1057 | 1085 | 1106 | 1133 | 1154 |
| | .10 | \$ 973 | 1001 | 1022 | 1050 | 1071 | 1098 | 1119 | 1140 | 1168 | 1189 | 1217 | 1238 |
| | .12 | \$ 1133 | 1161 | 1182 | 1210 | 1231 | 1259 | 1279 | 1300 | 1328 | 1349 | 1377 | 1398 |
| | .14 | \$ 1293 | 1321 | 1342 | 1370 | 1391 | 1419 | 1439 | 1460 | 1488 | 1509 | 1537 | 1558 |
| | .16 | \$ 1493 | 1481 | 1502 | 1530 | 1551 | 1579 | 1599 | 1620 | 1648 | 1669 | 1697 | 1718 |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 688 | 737 | 786 | 834 | 883 | 932 | 980 | 1029 | 1078 | 1126 | 1182 | 1231 |
| | .06 | \$ 758 | 806 | 855 | 904 | 952 | 1001 | 1050 | 1099 | 1147 | 1196 | 1252 | 1300 |
| | .07 | \$ 820 | 869 | 918 | 966 | 1015 | 1064 | 1112 | 1161 | 1210 | 1259 | 1314 | 1363 |
| | .08 | \$ 890 | 939 | 987 | 1036 | 1085 | 1133 | 1182 | 1231 | 1279 | 1328 | 1384 | 1432 |
| | .09 | \$ 959 | 1008 | 1057 | 1106 | 1154 | 1203 | 1252 | 1300 | 1349 | 1398 | 1453 | 1502 |
| | .10 | \$ 1029 | 1078 | 1126 | 1175 | 1224 | 1272 | 1321 | 1370 | 1419 | 1467 | 1523 | 1572 |
| | .12 | \$ 1161 | 1210 | 1259 | 1307 | 1356 | 1405 | 1453 | 1502 | 1551 | 1599 | 1655 | 1704 |
| | .14 | \$ 1300 | 1349 | 1398 | 1446 | 1495 | 1544 | 1592 | 1641 | 1690 | 1739 | 1794 | 1843 |
| | .16 | \$ 1439 | 1488 | 1537 | 1586 | 1634 | 1683 | 1732 | 1780 | 1829 | 1878 | 1933 | 1982 |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 813 | 883 | 959 | 1029 | 1106 | 1182 | 1252 | 1328 | 1398 | 1474 | 1544 | 1620 |
| | .06 | \$ 869 | 939 | 1015 | 1085 | 1161 | 1238 | 1307 | 1384 | 1453 | 1530 | 1599 | 1676 |
| | .07 | \$ 932 | 1001 | 1078 | 1147 | 1224 | 1300 | 1370 | 1446 | 1516 | 1592 | 1662 | 1739 |
| | .08 | \$ 987 | 1057 | 1133 | 1203 | 1279 | 1356 | 1426 | 1502 | 1572 | 1648 | 1718 | 1794 |
| | .09 | \$ 1050 | 1119 | 1196 | 1266 | 1342 | 1419 | 1488 | 1565 | 1634 | 1711 | 1780 | 1857 |
| | .10 | \$ 1106 | 1175 | 1252 | 1321 | 1398 | 1474 | 1544 | 1620 | 1690 | 1766 | 1836 | 1912 |
| | .12 | \$ 1224 | 1293 | 1370 | 1439 | 1516 | 1592 | 1662 | 1739 | 1808 | 1885 | 1954 | 2031 |
| | .14 | \$ 1342 | 1412 | 1488 | 1558 | 1634 | 1711 | 1780 | 1857 | 1926 | 2003 | 2072 | 2149 |
| | .16 | \$ 1467 | 1537 | 1613 | 1683 | 1759 | 1836 | 1905 | 1982 | 2052 | 2128 | 2198 | 2274 |
| 70,000 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 939 | 1022 | 1112 | 1196 | 1279 | 1370 | 1453 | 1537 | 1620 | 1711 | 1794 | 1878 |
| | .06 | \$ 1001 | 1085 | 1175 | 1259 | 1342 | 1432 | 1516 | 1599 | 1683 | 1773 | 1857 | 1940 |
| | .07 | \$ 1071 | 1154 | 1245 | 1328 | 1412 | 1502 | 1586 | 1669 | 1752 | 1843 | 1926 | 2010 |
| | .08 | \$ 1140 | 1224 | 1314 | 1398 | 1481 | 1572 | 1655 | 1739 | 1822 | 1912 | 1996 | 2079 |
| | .09 | \$ 1203 | 1286 | 1377 | 1460 | 1544 | 1634 | 1718 | 1801 | 1885 | 1975 | 2059 | 2142 |
| | .10 | \$ 1272 | 1356 | 1446 | 1530 | 1613 | 1704 | 1787 | 1871 | 1954 | 2045 | 2128 | 2212 |
| | .12 | \$ 1405 | 1488 | 1579 | 1662 | 1745 | 1836 | 1919 | 2003 | 2086 | 2177 | 2260 | 2344 |
| | .14 | \$ 1544 | 1627 | 1718 | 1801 | 1885 | 1975 | 2059 | 2142 | 2225 | 2316 | 2399 | 2483 |
| | .16 | \$ 1616 | 1759 | 1850 | 1933 | 2011 | 2107 | 2191 | 2274 | 2358 | 2448 | 2532 | 2615 |
| 80,000 | \$ 1092 | 1252 | 1405 | 1565 | 1718 | 1878 | 2031 | 2191 | 2344 | 2504 | 2657 | 2817 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 1071 | 1189 | 1300 | 1419 | 1537 | 1648 | 1766 | 1885 | 1996 | 2114 | 2225 | 2344 |
| | .06 | \$ 1119 | 1238 | 1349 | 1461 | 1586 | 1697 | 1815 | 1933 | 2045 | 2163 | 2274 | 2392 |
| | .07 | \$ 1175 | 1293 | 1405 | 1523 | 1611 | 1752 | 1871 | 1989 | 2100 | 2219 | 2330 | 2448 |
| | .08 | \$ 1224 | 1342 | 1453 | 1572 | 1690 | 1801 | 1919 | 2038 | 2149 | 2267 | 2379 | 2497 |
| | .09 | \$ 1278 | 1398 | 1509 | 1621 | 1745 | 1851 | 1975 | 2093 | 2205 | 2323 | 2434 | 2552 |
| | .10 | \$ 1328 | 1456 | 1558 | 1676 | 1794 | 1905 | 2024 | 2142 | 2253 | 2372 | 2483 | 2601 |
| | .12 | \$ 1432 | 1551 | 1662 | 1780 | 1899 | 2010 | 2128 | 2246 | 2358 | 2476 | 2587 | 2705 |
| | .14 | \$ 1537 | 1655 | 1766 | 1885 | 2003 | 2114 | 2232 | 2351 | 2462 | 2580 | 2692 | 2810 |
| | .16 | \$ 1641 | 1759 | 1871 | 1989 | 2107 | 2219 | 2337 | 2455 | 2566 | 2685 | 2796 | 2914 |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE \$/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| REGION 5 | | 36UHPOA/A42AS-A | | | | | | | | | | | | | |
|--|-------------------------|---------------------------------|------|------|------|------|------|------|------|------|------|------|--|------|------|
| HEAT PUMP MODEL: OUTDOOR 36UHPOA INDOOR A42AS-A | | | | | | | | | | | | | | | |
| ARI RATED COOLING CAP.: BTUH(95) 33400 SEER 9.30 | | | | | | | | | | | | | | | |
| ARI RATED HEATING CAP.: BTUH (47) 34800 COP(47) 3.00, BSPP 7.00 MIN.DHR REG IV | | | | | | | | | | | | | | | |
| BTUH (17) 20400 COP(17) 2.00 | | | | | | | | | | | | | | | |
| FURNACE TYPE PROPANE GAS | | FURNACE EFFICIENCY 78.00 % AFUE | | | | | | | | | | | | | |
| HEAT LOSS BTUH | ELEC. COST \$/KWH | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 |
| | | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | | | |
| 35,000 | \$ 626 | 674 | 730 | 779 | 834 | 883 | 939 | 987 | 1043 | 1147 | 1252 | 1252 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 556 | 570 | 584 | 605 | 619 | 633 | 653 | 667 | 681 | 716 | 744 | 744 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .06 | \$ 626 | 639 | 653 | 674 | 688 | 702 | 723 | 737 | 751 | 786 | 813 | 813 | | | |
| .07 | \$ 695 | 709 | 723 | 744 | 758 | 772 | 793 | 806 | 820 | 855 | 883 | 883 | | | |
| .08 | \$ 772 | 786 | 799 | 820 | 834 | 848 | 869 | 883 | 897 | 932 | 959 | 959 | | | |
| .09 | \$ 841 | 855 | 869 | 890 | 904 | 918 | 939 | 952 | 966 | 1001 | 1029 | 1029 | | | |
| .10 | \$ 911 | 925 | 939 | 959 | 973 | 987 | 1008 | 1022 | 1036 | 1071 | 1099 | 1099 | | | |
| .12 | \$ 1057 | 1071 | 1085 | 1106 | 1119 | 1133 | 1154 | 1168 | 1182 | 1217 | 1245 | 1245 | | | |
| .14 | \$ 1203 | 1217 | 1231 | 1252 | 1266 | 1279 | 1300 | 1314 | 1328 | 1363 | 1391 | 1391 | BALANCE POINT 13 DEG.F. | | |
| .16 | \$ 1342 | 1356 | 1370 | 1391 | 1405 | 1419 | 1439 | 1453 | 1467 | 1502 | 1530 | 1530 | | | |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 626 | 639 | 660 | 681 | 695 | 716 | 730 | 751 | 772 | 806 | 841 | 841 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .06 | \$ 702 | 716 | 737 | 758 | 771 | 793 | 806 | 827 | 848 | 883 | 918 | 918 | | | |
| .07 | \$ 786 | 799 | 820 | 841 | 855 | 876 | 890 | 911 | 932 | 966 | 1001 | 1001 | | | |
| .08 | \$ 869 | 883 | 904 | 925 | 939 | 959 | 973 | 994 | 1015 | 1050 | 1085 | 1085 | | | |
| .09 | \$ 946 | 959 | 980 | 1001 | 1015 | 1036 | 1050 | 1071 | 1092 | 1126 | 1161 | 1161 | | | |
| .10 | \$ 1029 | 1043 | 1064 | 1085 | 1099 | 1119 | 1133 | 1154 | 1175 | 1210 | 1245 | 1245 | | | |
| .12 | \$ 1189 | 1203 | 1224 | 1245 | 1259 | 1279 | 1293 | 1314 | 1335 | 1370 | 1405 | 1405 | BALANCE POINT 16 DEG.F. | | |
| .14 | \$ 1349 | 1363 | 1384 | 1405 | 1419 | 1439 | 1453 | 1474 | 1495 | 1530 | 1565 | 1565 | | | |
| .16 | \$ 1509 | 1523 | 1544 | 1565 | 1579 | 1599 | 1613 | 1634 | 1655 | 1690 | 1725 | 1725 | | | |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 793 | 827 | 869 | 904 | 939 | 980 | 1015 | 1057 | 1092 | 1168 | 1245 | 1245 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .06 | \$ 862 | 897 | 939 | 973 | 1008 | 1050 | 1085 | 1126 | 1161 | 1238 | 1314 | 1314 | | | |
| .07 | \$ 925 | 959 | 1001 | 1036 | 1071 | 1112 | 1147 | 1189 | 1224 | 1300 | 1377 | 1377 | | | |
| .08 | \$ 994 | 1029 | 1071 | 1106 | 1140 | 1182 | 1217 | 1259 | 1293 | 1370 | 1446 | 1446 | | | |
| .09 | \$ 1064 | 1099 | 1140 | 1175 | 1210 | 1253 | 1286 | 1328 | 1363 | 1439 | 1516 | 1516 | | | |
| .10 | \$ 1133 | 1168 | 1210 | 1245 | 1279 | 1321 | 1356 | 1398 | 1432 | 1509 | 1586 | 1586 | BALANCE POINT 22 DEG.F. | | |
| .12 | \$ 1266 | 1300 | 1342 | 1377 | 1412 | 1453 | 1488 | 1530 | 1565 | 1641 | 1718 | 1718 | | | |
| .14 | \$ 1405 | 1439 | 1481 | 1516 | 1551 | 1592 | 1627 | 1669 | 1704 | 1780 | 1857 | 1857 | | | |
| .16 | \$ 1544 | 1579 | 1620 | 1655 | 1690 | 1732 | 1766 | 1808 | 1843 | 1919 | 1996 | 1996 | | | |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 966 | 1022 | 1078 | 1140 | 1196 | 1252 | 1307 | 1363 | 1419 | 1530 | 1641 | 1641 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .06 | \$ 1022 | 1078 | 1133 | 1196 | 1252 | 1307 | 1363 | 1419 | 1474 | 1586 | 1697 | 1697 | | | |
| .07 | \$ 1085 | 1140 | 1196 | 1259 | 1314 | 1370 | 1426 | 1481 | 1537 | 1648 | 1759 | 1759 | | | |
| .08 | \$ 1140 | 1196 | 1252 | 1314 | 1370 | 1426 | 1481 | 1537 | 1592 | 1704 | 1815 | 1815 | | | |
| .09 | \$ 1203 | 1259 | 1314 | 1377 | 1432 | 1488 | 1544 | 1599 | 1655 | 1766 | 1878 | 1878 | BALANCE POINT 27 DEG.F. | | |
| .10 | \$ 1259 | 1314 | 1370 | 1432 | 1488 | 1544 | 1599 | 1655 | 1711 | 1822 | 1933 | 1933 | | | |
| .12 | \$ 1377 | 1432 | 1488 | 1551 | 1606 | 1662 | 1718 | 1773 | 1829 | 1940 | 2052 | 2052 | | | |
| .14 | \$ 1495 | 1551 | 1606 | 1669 | 1725 | 1780 | 1836 | 1892 | 1947 | 2059 | 2170 | 2170 | | | |
| .16 | \$ 1620 | 1676 | 1732 | 1794 | 1850 | 1905 | 1961 | 2017 | 2072 | 2184 | 2295 | 2295 | | | |
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1119 | 1189 | 1252 | 1321 | 1384 | 1446 | 1516 | 1579 | 1641 | 1773 | 1905 | 1905 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .06 | \$ 1182 | 1252 | 1314 | 1384 | 1446 | 1509 | 1579 | 1641 | 1704 | 1836 | 1968 | 1968 | | | |
| .07 | \$ 1252 | 1321 | 1384 | 1453 | 1516 | 1579 | 1648 | 1711 | 1773 | 1905 | 2038 | 2038 | | | |
| .08 | \$ 1321 | 1391 | 1453 | 1523 | 1580 | 1648 | 1718 | 1780 | 1843 | 1975 | 2107 | 2107 | | | |
| .09 | \$ 1384 | 1453 | 1516 | 1586 | 1648 | 1711 | 1780 | 1843 | 1905 | 2038 | 2170 | 2170 | | | |
| .10 | \$ 1453 | 1523 | 1586 | 1655 | 1718 | 1780 | 1850 | 1912 | 1975 | 2107 | 2239 | 2239 | | | |
| .12 | \$ 1586 | 1655 | 1718 | 1787 | 1850 | 1912 | 1982 | 2045 | 2107 | 2239 | 2372 | 2372 | | | |
| .14 | \$ 1725 | 1794 | 1857 | 1926 | 1989 | 2052 | 2121 | 2184 | 2246 | 2379 | 2511 | 2511 | BALANCE POINT 31 DEG.F. | | |
| .16 | \$ 1857 | 1926 | 1989 | 2059 | 2121 | 2184 | 2253 | 2316 | 2379 | 2511 | 2643 | 2643 | | | |
| 80,000 | \$ 1426 | 1551 | 1669 | 1787 | 1905 | 2024 | 2142 | 2260 | 2385 | 2622 | 2858 | 2858 | <--THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1321 | 1412 | 1495 | 1586 | 1676 | 1759 | 1850 | 1940 | 2024 | 2198 | 2379 | 2379 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | |
| .06 | \$ 1370 | 1460 | 1544 | 1634 | 1725 | 1808 | 1899 | 1989 | 2072 | 2246 | 2427 | 2427 | | | |
| .07 | \$ 1426 | 1516 | 1599 | 1690 | 1780 | 1864 | 1954 | 2045 | 2128 | 2302 | 2483 | 2483 | | | |
| .08 | \$ 1474 | 1565 | 1648 | 1739 | 1829 | 1912 | 2003 | 2093 | 2177 | 2351 | 2532 | 2532 | | | |
| .09 | \$ 1530 | 1620 | 1704 | 1794 | 1885 | 1968 | 2059 | 2149 | 2232 | 2406 | 2587 | 2587 | | | |
| .10 | \$ 1579 | 1669 | 1752 | 1843 | 1933 | 2017 | 2107 | 2198 | 2281 | 2455 | 2636 | 2636 | | | |
| .12 | \$ 1683 | 1773 | 1857 | 1947 | 2038 | 2121 | 2212 | 2302 | 2385 | 2559 | 2740 | 2740 | BALANCE POINT 34 DEG.F. | | |
| .14 | \$ 1787 | 1878 | 1961 | 2052 | 2142 | 2225 | 2316 | 2406 | 2490 | 2664 | 2845 | 2845 | | | |
| .16 | \$ 1892 | 1982 | 20 | | | | | | | | | | | | |

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 42UHPQA/A61AO-A
 HEAT PUMP MODEL: OUTDOOR 42UHPQA INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH(95) 44000, SEER11.30
 ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPE 7.60 MIN.DER REG IV
 BTUH (17) 25000, COP(17) 2.20
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH |
|-------------------|-------------------------|
|-------------------|-------------------------|

50,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 841 | 1544 |
| .06 | \$ | 1001 | 1857 |
| .07 | \$ | 1168 | 2170 |
| .08 | \$ | 1335 | 2476 |
| .09 | \$ | 1509 | 2789 |
| .10 | \$ | 1676 | 3095 |
| .12 | \$ | 2010 | 3721 |
| .14 | \$ | 2351 | 4340 |
| .16 | \$ | 2678 | 4959 |

BALANCE POINT 16 DEG.F.

60,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1022 | 1857 |
| .06 | \$ | 1231 | 2232 |
| .07 | \$ | 1439 | 2601 |
| .08 | \$ | 1634 | 2971 |
| .09 | \$ | 1843 | 3345 |
| .10 | \$ | 2052 | 3721 |
| .12 | \$ | 2462 | 4465 |
| .14 | \$ | 2872 | 5210 |
| .16 | \$ | 3283 | 5954 |

BALANCE POINT 22 DEG.F.

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1231 | 2170 |
| .06 | \$ | 1481 | 2601 |
| .07 | \$ | 1725 | 3039 |
| .08 | \$ | 1968 | 3471 |
| .09 | \$ | 2225 | 3902 |
| .10 | \$ | 2469 | 4340 |
| .12 | \$ | 2963 | 5210 |
| .14 | \$ | 3450 | 6079 |
| .16 | \$ | 3951 | 6942 |

BALANCE POINT 26 DEG.F.

80,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1460 | 2476 |
| .06 | \$ | 1759 | 2977 |
| .07 | \$ | 2045 | 3471 |
| .08 | \$ | 2337 | 3965 |
| .09 | \$ | 2636 | 4465 |
| .10 | \$ | 2921 | 4959 |
| .12 | \$ | 3505 | 5954 |
| .14 | \$ | 4097 | 6942 |
| .16 | \$ | 4681 | 7936 |

BALANCE POINT 30 DEG.F.

90,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1704 | 2789 |
| .06 | \$ | 2038 | 3345 |
| .07 | \$ | 2385 | 3902 |
| .08 | \$ | 2726 | 4465 |
| .09 | \$ | 3060 | 5022 |
| .10 | \$ | 3408 | 5578 |
| .12 | \$ | 4083 | 6698 |
| .14 | \$ | 4764 | 7811 |
| .16 | \$ | 5446 | 8931 |

BALANCE POINT 33 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| \$ | 77 | 93 | 109 | 124 | 140 | 155 | 186 | 218 | 249 |

--ELECTRIC RATE \$/KWH
 --THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| REGION 5 HEAT PUMP MODEL: OUTDOOR 42UHPOA INDOOR A61AO-A ARI RATED COOLING CAP.: BTUH(95) 44000, SEER11.30 ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, EER 7.60 MIN.DHR REG IV BTUH (17) 25000, COP(17) 2.20 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE | | | | | | | | | | | | | | |
|---|-------------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| HEAT LOSS BTUH | ELEC. COST \$/KWH | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 | |
| 40,000 | \$ 375 | 431 | 486 | 542 | 591 | 646 | 702 | 758 | 813 | 862 | 973 | 1085 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 514 | 528 | 542 | 549 | 563 | 577 | 591 | 598 | 612 | 626 | 646 | 674 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| .06 | \$ 605 | 619 | 633 | 639 | 653 | 667 | 681 | 688 | 702 | 716 | 737 | 765 | | |
| .07 | \$ 688 | 702 | 716 | 723 | 737 | 751 | 765 | 772 | 786 | 799 | 820 | 848 | | |
| .08 | \$ 779 | 793 | 806 | 813 | 827 | 841 | 855 | 862 | 876 | 890 | 911 | 939 | | |
| .09 | \$ 862 | 876 | 890 | 897 | 911 | 925 | 939 | 946 | 959 | 973 | 994 | 1022 | | |
| .10 | \$ 952 | 966 | 980 | 987 | 1001 | 1015 | 1029 | 1036 | 1050 | 1064 | 1085 | 1112 | | |
| .12 | \$ 1126 | 1140 | 1154 | 1161 | 1175 | 1189 | 1203 | 1210 | 1224 | 1238 | 1259 | 1286 | | |
| .14 | \$ 1293 | 1307 | 1321 | 1328 | 1342 | 1356 | 1370 | 1377 | 1391 | 1405 | 1426 | 1453 | | |
| .16 | \$ 1467 | 1481 | 1495 | 1502 | 1516 | 1530 | 1544 | 1551 | 1565 | 1579 | 1599 | 1627 | BALANCE POINT 11 DEG.F. | |
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 605 | 626 | 646 | 667 | 688 | 709 | 730 | 751 | 772 | 793 | 834 | 876 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| .06 | \$ 695 | 716 | 737 | 758 | 779 | 799 | 820 | 841 | 862 | 883 | 925 | 966 | | |
| .07 | \$ 793 | 813 | 834 | 855 | 876 | 897 | 918 | 939 | 959 | 980 | 1022 | 1064 | | |
| .08 | \$ 883 | 904 | 925 | 946 | 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1112 | 1154 | | |
| .09 | \$ 973 | 994 | 1015 | 1036 | 1057 | 1078 | 1099 | 1119 | 1140 | 1161 | 1203 | 1245 | | |
| .10 | \$ 1064 | 1085 | 1106 | 1126 | 1147 | 1168 | 1189 | 1210 | 1231 | 1252 | 1293 | 1335 | | |
| .12 | \$ 1252 | 1272 | 1293 | 1314 | 1335 | 1356 | 1377 | 1398 | 1419 | 1439 | 1481 | 1523 | | |
| .14 | \$ 1432 | 1453 | 1474 | 1495 | 1516 | 1537 | 1558 | 1579 | 1599 | 1620 | 1662 | 1704 | | |
| .16 | \$ 1620 | 1641 | 1662 | 1683 | 1704 | 1725 | 1745 | 1766 | 1787 | 1808 | 1850 | 1892 | BALANCE POINT 16 DEG.F. | |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 660 | 702 | 744 | 786 | 827 | 869 | 911 | 952 | 994 | 1029 | 1112 | 1196 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| .06 | \$ 737 | 779 | 820 | 862 | 904 | 946 | 987 | 1029 | 1071 | 1106 | 1189 | 1272 | | |
| .07 | \$ 813 | 855 | 897 | 939 | 980 | 1022 | 1064 | 1106 | 1147 | 1182 | 1266 | 1349 | | |
| .08 | \$ 890 | 932 | 973 | 1015 | 1057 | 1092 | 1140 | 1182 | 1224 | 1259 | 1342 | 1426 | | |
| .09 | \$ 986 | 1008 | 1050 | 1092 | 1133 | 1175 | 1217 | 1259 | 1300 | 1335 | 1419 | 1502 | | |
| .10 | \$ 1043 | 1085 | 1126 | 1168 | 1210 | 1252 | 1293 | 1335 | 1377 | 1412 | 1495 | 1579 | | |
| .12 | \$ 1189 | 1231 | 1272 | 1314 | 1356 | 1398 | 1439 | 1481 | 1523 | 1558 | 1641 | 1725 | | |
| .14 | \$ 1342 | 1384 | 1426 | 1467 | 1509 | 1551 | 1592 | 1634 | 1676 | 1711 | 1794 | 1878 | | |
| .16 | \$ 1495 | 1537 | 1579 | 1620 | 1662 | 1704 | 1745 | 1787 | 1829 | 1864 | 1947 | 2031 | BALANCE POINT 22 DEG.F. | |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 765 | 813 | 862 | 911 | 959 | 1008 | 1050 | 1099 | 1147 | 1196 | 1293 | 1391 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| .06 | \$ 848 | 897 | 946 | 994 | 1043 | 1092 | 1133 | 1182 | 1231 | 1279 | 1377 | 1474 | | |
| .07 | \$ 939 | 987 | 1036 | 1085 | 1133 | 1182 | 1224 | 1272 | 1321 | 1370 | 1467 | 1565 | | |
| .08 | \$ 1022 | 1071 | 1119 | 1168 | 1217 | 1266 | 1307 | 1356 | 1405 | 1453 | 1551 | 1648 | | |
| .09 | \$ 1106 | 1154 | 1203 | 1252 | 1300 | 1349 | 1391 | 1439 | 1488 | 1537 | 1634 | 1732 | | |
| .10 | \$ 1196 | 1245 | 1293 | 1342 | 1391 | 1439 | 1481 | 1530 | 1579 | 1627 | 1725 | 1822 | | |
| .12 | \$ 1363 | 1412 | 1460 | 1509 | 1558 | 1606 | 1648 | 1697 | 1745 | 1794 | 1892 | 1989 | | |
| .14 | \$ 1537 | 1586 | 1634 | 1683 | 1732 | 1780 | 1822 | 1871 | 1919 | 1968 | 2065 | 2163 | | |
| .16 | \$ 1711 | 1759 | 1808 | 1857 | 1905 | 1954 | 1996 | 2045 | 2093 | 2142 | 2239 | 2337 | BALANCE POINT 26 DEG.F. | |
| 80,000 | \$ 758 | 862 | 973 | 1085 | 1189 | 1300 | 1405 | 1516 | 1627 | 1732 | 1947 | 2170 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 834 | 904 | 973 | 1036 | 1106 | 1175 | 1245 | 1307 | 1377 | 1446 | 1579 | 1718 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| .06 | \$ 904 | 973 | 1043 | 1112 | 1175 | 1245 | 1314 | 1384 | 1446 | 1516 | 1648 | 1787 | | |
| .07 | \$ 973 | 1043 | 1119 | 1189 | 1252 | 1321 | 1391 | 1460 | 1523 | 1662 | 1794 | 1933 | | |
| .08 | \$ 1050 | 1119 | 1189 | 1252 | 1321 | 1391 | 1460 | 1523 | 1592 | 1732 | 1864 | 2003 | | |
| .09 | \$ 1119 | 1189 | 1259 | 1321 | 1391 | 1460 | 1530 | 1592 | 1662 | 1732 | 1864 | 2003 | | |
| .10 | \$ 1189 | 1259 | 1328 | 1391 | 1460 | 1530 | 1599 | 1662 | 1732 | 1801 | 1933 | 2072 | | |
| .12 | \$ 1335 | 1405 | 1474 | 1537 | 1601 | 1676 | 1745 | 1808 | 1878 | 1947 | 2079 | 2219 | | |
| .14 | \$ 1481 | 1551 | 1620 | 1683 | 1752 | 1822 | 1892 | 1954 | 2024 | 2093 | 2225 | 2365 | | |
| .16 | \$ 1620 | 1690 | 1759 | 1822 | 1892 | 1961 | 2031 | 2093 | 2163 | 2232 | 2365 | 2504 | BALANCE POINT 30 DEG.F. | |
| 90,000 | \$ 848 | 973 | 1099 | 1217 | 1342 | 1460 | 1586 | 1704 | 1829 | 1947 | 2198 | 2441 | --THEORETICAL HEATING COST * FURNACE ONLY | |
| .05 | \$ 904 | 994 | 1085 | 1175 | 1266 | 1356 | 1439 | 1530 | 1620 | 1711 | 1892 | 2072 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | |
| .06 | \$ 959 | 1050 | 1140 | 1231 | 1321 | 1412 | 1495 | 1586 | 1676 | 1766 | 1947 | 2128 | | |
| .07 | \$ 1015 | 1106 | 1196 | 1286 | 1377 | 1467 | 1551 | 1641 | 1732 | 1822 | 2003 | 2184 | | |
| .08 | \$ 1071 | 1161 | 1252 | 1342 | 1432 | 1523 | 1606 | 1697 | 1787 | 1878 | 2059 | 2239 | | |
| .09 | \$ 1119 | 1210 | 1300 | 1391 | 1481 | 1572 | 1659 | 1745 | 1836 | 1926 | 2107 | 2288 | | |
| .10 | \$ 1175 | 1266 | 1356 | 1446 | 1537 | 1627 | 1711 | 1801 | 1892 | 1982 | 2163 | 2344 | | |
| .12 | \$ 1286 | 1377 | 1467 | 1558 | 1648 | 1732 | 1822 | 1912 | 2003 | 2093 | 2274 | 2455 | | |
| .14 | \$ 1398 | 1488 | 1579 | 1669 | 1759 | 1850 | 1933 | 2024 | 2114 | 2205 | 2388 | 2566 | | |
| .16 | \$ 1502 | 1592 | 1683 | 1773 | 1864 | 1954 | 2038 | 2128 | 2219 | 2309 | 2490 | 2671 | | |
| ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP | | | | | | | | | | | | | | |
| .05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE \$/KWH | | | | | | | | | | | | | | |
| THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN. | | | | | | | | | | | | | | |

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| | | 42UHPOA/A61AO-A | | | | | | | | | | | | | |
|-------------------|-------------------------|--|------|------|------|------|------|------|---------------------------------|------|------|------|---|--|--|
| | | HEAT PUMP MODEL: OUTDOOR 42UHPOA INDOOR A61AO-A | | | | | | | | | | | | | |
| | | ARI RATED COOLING CAP.: BTUH(95°) 44000 SEER11.30 | | | | | | | | | | | | | |
| | | ARI RATED HEATING CAP.: BTUH (47°) 41000 COP(47°) 3.40, BSPF 7.60 MIN.DHR REG IV | | | | | | | | | | | | | |
| | | BTUH (17°) 25000, COP(17°) 2.20 | | | | | | | FURNACE EFFICIENCY 78.00 % AFUE | | | | | | |
| HEAT LOSS BTUH | ELEC. COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | |
| | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | | |
| 40,000 | \$ 542 | 626 | 702 | 779 | 855 | 939 | 1015 | 1092 | 1168 | 1252 | 1328 | 1405 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 556 | 570 | 591 | 605 | 626 | 639 | 660 | 674 | 695 | 709 | 730 | 744 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | |
| .06 | \$ 646 | 660 | 681 | 695 | 716 | 730 | 751 | 765 | 786 | 799 | 820 | 834 | \$ PER YEAR | | |
| .07 | \$ 730 | 744 | 765 | 779 | 813 | 834 | 848 | 869 | 883 | 904 | 918 | | | | |
| .08 | \$ 820 | 834 | 855 | 869 | 890 | 904 | 925 | 939 | 959 | 973 | 994 | 1008 | | | |
| .09 | \$ 904 | 918 | 939 | 952 | 973 | 987 | 1008 | 1022 | 1043 | 1057 | 1078 | 1092 | | | |
| .10 | \$ 994 | 1008 | 1029 | 1043 | 1064 | 1078 | 1099 | 1122 | 1133 | 1147 | 1168 | 1182 | | | |
| .12 | \$ 1168 | 1182 | 1203 | 1217 | 1238 | 1252 | 1272 | 1286 | 1307 | 1321 | 1342 | 1356 | | | |
| .14 | \$ 1335 | 1349 | 1370 | 1384 | 1405 | 1419 | 1439 | 1453 | 1474 | 1488 | 1509 | 1523 | | | |
| .16 | \$ 1509 | 1523 | 1544 | 1558 | 1579 | 1592 | 1613 | 1627 | 1648 | 1662 | 1683 | 1697 | BALANCE POINT 11 DEG.F. | | |
| 50,000 | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 667 | 702 | 730 | 758 | 793 | 820 | 848 | 883 | 911 | 939 | 973 | 1001 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | |
| .06 | \$ 758 | 793 | 820 | 848 | 883 | 911 | 939 | 973 | 1001 | 1029 | 1064 | 1092 | \$ PER YEAR | | |
| .07 | \$ 855 | 890 | 918 | 946 | 980 | 1008 | 1036 | 1071 | 1099 | 1126 | 1161 | 1189 | | | |
| .08 | \$ 946 | 980 | 1008 | 1036 | 1071 | 1099 | 1126 | 1161 | 1189 | 1217 | 1252 | 1279 | | | |
| .09 | \$ 1036 | 1071 | 1099 | 1126 | 1161 | 1189 | 1217 | 1254 | 1282 | 1307 | 1341 | 1370 | | | |
| .10 | \$ 1126 | 1161 | 1189 | 1217 | 1252 | 1279 | 1307 | 1342 | 1370 | 1398 | 1432 | 1460 | | | |
| .12 | \$ 1314 | 1349 | 1377 | 1405 | 1439 | 1467 | 1495 | 1530 | 1558 | 1586 | 1620 | 1648 | | | |
| .14 | \$ 1495 | 1530 | 1558 | 1586 | 1620 | 1648 | 1676 | 1711 | 1739 | 1766 | 1801 | 1829 | | | |
| .16 | \$ 1683 | 1718 | 1745 | 1773 | 1808 | 1836 | 1864 | 1899 | 1926 | 1954 | 1989 | 2017 | BALANCE POINT 16 DEG.F. | | |
| 60,000 | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 793 | 848 | 911 | 966 | 1029 | 1085 | 1147 | 1203 | 1266 | 1321 | 1384 | 1439 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | |
| .06 | \$ 869 | 925 | 987 | 1043 | 1106 | 1161 | 1224 | 1279 | 1342 | 1398 | 1460 | 1516 | \$ PER YEAR | | |
| .07 | \$ 946 | 1001 | 1064 | 1119 | 1182 | 1238 | 1300 | 1356 | 1419 | 1474 | 1537 | 1592 | | | |
| .08 | \$ 1022 | 1078 | 1140 | 1196 | 1259 | 1314 | 1377 | 1434 | 1495 | 1551 | 1613 | 1669 | | | |
| .09 | \$ 1099 | 1154 | 1211 | 1272 | 1335 | 1391 | 1453 | 1509 | 1572 | 1627 | 1690 | 1745 | | | |
| .10 | \$ 1175 | 1231 | 1293 | 1349 | 1412 | 1467 | 1530 | 1586 | 1648 | 1704 | 1760 | 1822 | | | |
| .12 | \$ 1321 | 1377 | 1439 | 1495 | 1558 | 1613 | 1676 | 1732 | 1794 | 1850 | 1912 | 1968 | | | |
| .14 | \$ 1474 | 1530 | 1592 | 1648 | 1711 | 1766 | 1829 | 1885 | 1947 | 2003 | 2065 | 2121 | | | |
| .16 | \$ 1627 | 1683 | 1745 | 1801 | 1864 | 1919 | 1982 | 2038 | 2100 | 2156 | 2219 | 2274 | BALANCE POINT 22 DEG.F. | | |
| 70,000 | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 911 | 980 | 1050 | 1119 | 1189 | 1259 | 1328 | 1398 | 1467 | 1537 | 1606 | 1676 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | |
| .06 | \$ 994 | 1064 | 1133 | 1203 | 1272 | 1342 | 1412 | 1481 | 1551 | 1620 | 1690 | 1759 | \$ PER YEAR | | |
| .07 | \$ 1085 | 1154 | 1224 | 1293 | 1363 | 1432 | 1502 | 1572 | 1641 | 1711 | 1780 | 1850 | | | |
| .08 | \$ 1168 | 1238 | 1307 | 1377 | 1446 | 1516 | 1586 | 1655 | 1725 | 1794 | 1864 | 1933 | | | |
| .09 | \$ 1252 | 1321 | 1391 | 1460 | 1530 | 1599 | 1669 | 1739 | 1808 | 1878 | 1947 | 2017 | | | |
| .10 | \$ 1342 | 1412 | 1481 | 1551 | 1620 | 1690 | 1759 | 1829 | 1899 | 1968 | 2038 | 2107 | | | |
| .12 | \$ 1509 | 1579 | 1648 | 1718 | 1787 | 1857 | 1926 | 1996 | 2065 | 2135 | 2205 | 2274 | | | |
| .14 | \$ 1683 | 1752 | 1822 | 1892 | 1961 | 2031 | 2100 | 2170 | 2239 | 2309 | 2379 | 2448 | | | |
| .16 | \$ 1857 | 1926 | 1996 | 2065 | 2135 | 2205 | 2274 | 2344 | 2413 | 2483 | 2552 | 2622 | BALANCE POINT 26 DEG.F. | | |
| 80,000 | \$ 1092 | 1252 | 1405 | 1565 | 1718 | 1878 | 2031 | 2191 | 2344 | 2504 | 2657 | 2817 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1043 | 1140 | 1245 | 1342 | 1439 | 1537 | 1634 | 1732 | 1829 | 1926 | 2024 | 2121 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | |
| .06 | \$ 1182 | 1210 | 1314 | 1412 | 1509 | 1606 | 1704 | 1801 | 1899 | 1996 | 2093 | 2191 | \$ PER YEAR | | |
| .07 | \$ 1279 | 1384 | 1481 | 1579 | 1676 | 1773 | 1871 | 1968 | 2065 | 2163 | 2260 | | | | |
| .08 | \$ 1259 | 1356 | 1460 | 1558 | 1655 | 1752 | 1850 | 1947 | 2045 | 2142 | 2239 | 2337 | | | |
| .09 | \$ 1328 | 1426 | 1530 | 1627 | 1725 | 1822 | 1919 | 2017 | 2114 | 2212 | 2309 | 2406 | | | |
| .10 | \$ 1398 | 1495 | 1599 | 1697 | 1794 | 1892 | 1989 | 2086 | 2184 | 2281 | 2379 | 2476 | | | |
| .12 | \$ 1544 | 1641 | 1745 | 1843 | 1940 | 2038 | 2135 | 2232 | 2330 | 2427 | 2525 | 2622 | | | |
| .14 | \$ 1690 | 1787 | 1892 | 1989 | 2086 | 2184 | 2281 | 2379 | 2476 | 2573 | 2671 | 2768 | | | |
| .16 | \$ 1829 | 1926 | 2031 | 2128 | 2225 | 2323 | 2420 | 2518 | 2615 | 2712 | 2810 | 2907 | BALANCE POINT 30 DEG.F. | | |
| 90,000 | \$ 1231 | 1405 | 1579 | 1759 | 1933 | 2107 | 2288 | 2462 | 2636 | 2817 | 2991 | 3165 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1182 | 1307 | 1439 | 1572 | 1704 | 1829 | 1961 | 2093 | 2219 | 2351 | 2483 | 2608 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | |
| .06 | \$ 1238 | 1363 | 1495 | 1627 | 1759 | 1885 | 2017 | 2149 | 2274 | 2406 | 2538 | 2664 | \$ PER YEAR | | |
| .07 | \$ 1293 | 1419 | 1551 | 1683 | 1815 | 1940 | 2072 | 2205 | 2330 | 2462 | 2594 | 2719 | | | |
| .08 | \$ 1349 | 1474 | 1606 | 1739 | 1871 | 1996 | 2128 | 2260 | 2385 | 2518 | 2650 | 2775 | | | |
| .09 | \$ 1398 | 1523 | 1655 | 1787 | 1919 | 2045 | 2177 | 2309 | 2434 | 2568 | 2698 | 2824 | | | |
| .10 | \$ 1453 | 1579 | 1711 | 1843 | 1975 | 2100 | 2232 | 2365 | 2490 | 2622 | 2754 | 2879 | | | |
| .12 | \$ 1565 | 1690 | 1822 | 1954 | 2086 | 2212 | 2344 | 2476 | 2601 | 2733 | 2865 | 2991 | | | |
| .14 | \$ 1676 | 1801 | 1933 | 2065 | 2198 | 2323 | 2455 | 2587 | 2712 | 2845 | 2977 | 3102 | | | |
| .16 | \$ 1780 | 1905 | 2038 | 2170 | 2302 | 2427 | 2559 | 2692 | 2817 | 2949 | 3081 | 3206 | BALANCE POINT 33 DEG.F. | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

.05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE \$/KWH

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
HEAT PUMP MODEL: OUTDOOR 42UHPOA INDOOR A61AO-A
ARI RATED COOLING CAP.: BTUH(95°) 44000, SEER11.30
ARI RATED HEATING CAP.: BTUH (47°) 41000, COP(47°) 3.40, HSPF 7.60 MIN.DER REG IV
BTUH (17°) 25000, COP(17°) 2.20
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 |
|------------------------------|-------------------------|------|------|------|------|------|------|------|------|------|------|------|--|------|------|------|
| PROPANE GAS COST - \$/GALLON | | | | | | | | | | | | | | | | |
| 40,000 | \$ 709 | 772 | 834 | 890 | 952 | 1008 | 1071 | 1126 | 1189 | 1307 | 1426 | 1426 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 591 | 605 | 619 | 633 | 646 | 660 | 674 | 681 | 695 | 723 | 751 | 751 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .06 | \$ 681 | 695 | 709 | 723 | 737 | 751 | 765 | 772 | 786 | 813 | 841 | 841 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 765 | 779 | 793 | 806 | 820 | 834 | 848 | 855 | 869 | 897 | 925 | 925 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .08 | \$ 855 | 869 | 883 | 897 | 911 | 925 | 939 | 946 | 959 | 987 | 1015 | 1015 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .09 | \$ 939 | 952 | 966 | 980 | 994 | 1008 | 1022 | 1029 | 1043 | 1071 | 1099 | 1099 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .10 | \$ 1029 | 1043 | 1057 | 1071 | 1085 | 1099 | 1112 | 1119 | 1133 | 1161 | 1189 | 1189 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .12 | \$ 1203 | 1217 | 1231 | 1245 | 1259 | 1272 | 1286 | 1293 | 1307 | 1335 | 1363 | 1363 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .14 | \$ 1370 | 1384 | 1398 | 1412 | 1426 | 1439 | 1453 | 1460 | 1474 | 1502 | 1530 | 1530 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .16 | \$ 1544 | 1558 | 1572 | 1586 | 1599 | 1613 | 1627 | 1634 | 1648 | 1676 | 1704 | 1704 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 737 | 758 | 779 | 799 | 827 | 848 | 869 | 897 | 918 | 966 | 1008 | 1008 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .06 | \$ 827 | 848 | 869 | 890 | 918 | 939 | 959 | 987 | 1008 | 1057 | 1099 | 1099 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 925 | 946 | 966 | 987 | 1015 | 1036 | 1057 | 1085 | 1106 | 1154 | 1196 | 1196 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .08 | \$ 1015 | 1036 | 1057 | 1078 | 1106 | 1126 | 1147 | 1175 | 1196 | 1245 | 1285 | 1286 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .09 | \$ 1106 | 1126 | 1147 | 1168 | 1196 | 1217 | 1238 | 1266 | 1286 | 1335 | 1377 | 1377 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .10 | \$ 1196 | 1217 | 1238 | 1259 | 1286 | 1307 | 1328 | 1356 | 1377 | 1426 | 1467 | 1467 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .12 | \$ 1384 | 1405 | 1426 | 1446 | 1474 | 1495 | 1516 | 1544 | 1565 | 1613 | 1655 | 1655 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .14 | \$ 1565 | 1586 | 1606 | 1627 | 1655 | 1676 | 1697 | 1725 | 1745 | 1794 | 1836 | 1836 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .16 | \$ 1752 | 1773 | 1794 | 1815 | 1843 | 1864 | 1885 | 1912 | 1933 | 1982 | 2024 | 2024 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 918 | 959 | 1008 | 1050 | 1099 | 1140 | 1189 | 1231 | 1279 | 1370 | 1460 | 1460 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .06 | \$ 994 | 1036 | 1085 | 1126 | 1175 | 1217 | 1266 | 1307 | 1356 | 1446 | 1537 | 1537 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1071 | 1112 | 1161 | 1203 | 1252 | 1293 | 1342 | 1384 | 1432 | 1523 | 1613 | 1613 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .08 | \$ 1147 | 1189 | 1238 | 1279 | 1328 | 1370 | 1419 | 1460 | 1509 | 1599 | 1690 | 1690 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .09 | \$ 1224 | 1265 | 1314 | 1356 | 1405 | 1446 | 1495 | 1537 | 1586 | 1676 | 1766 | 1766 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .10 | \$ 1300 | 1342 | 1391 | 1432 | 1481 | 1523 | 1572 | 1613 | 1652 | 1752 | 1843 | 1843 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .12 | \$ 1446 | 1488 | 1537 | 1579 | 1621 | 1669 | 1718 | 1759 | 1808 | 1899 | 1989 | 1989 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .14 | \$ 1599 | 1641 | 1690 | 1732 | 1780 | 1822 | 1871 | 1912 | 1961 | 2052 | 2142 | 2142 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .16 | \$ 1752 | 1794 | 1843 | 1885 | 1933 | 1975 | 2024 | 2065 | 2114 | 2205 | 2295 | 2295 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 1064 | 1112 | 1168 | 1217 | 1272 | 1328 | 1377 | 1432 | 1481 | 1586 | 1697 | 1697 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .06 | \$ 1147 | 1196 | 1252 | 1300 | 1356 | 1412 | 1460 | 1516 | 1565 | 1669 | 1780 | 1780 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1238 | 1286 | 1342 | 1391 | 1446 | 1502 | 1551 | 1606 | 1655 | 1759 | 1871 | 1871 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .08 | \$ 1321 | 1370 | 1426 | 1474 | 1530 | 1586 | 1634 | 1690 | 1739 | 1843 | 1954 | 1954 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .09 | \$ 1405 | 1453 | 1509 | 1558 | 1613 | 1669 | 1718 | 1773 | 1822 | 1926 | 2038 | 2038 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .10 | \$ 1495 | 1544 | 1599 | 1648 | 1704 | 1759 | 1808 | 1864 | 1912 | 2017 | 2128 | 2128 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .12 | \$ 1662 | 1711 | 1766 | 1815 | 1871 | 1926 | 1975 | 2031 | 2079 | 2184 | 2295 | 2295 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .14 | \$ 1836 | 1885 | 1940 | 1989 | 2045 | 2100 | 2149 | 2205 | 2253 | 2358 | 2469 | 2469 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .16 | \$ 2010 | 2059 | 2114 | 2163 | 2219 | 2274 | 2323 | 2379 | 2427 | 2532 | 2643 | 2643 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| 80,000 | \$ 1426 | 1551 | 1669 | 1787 | 1905 | 2024 | 2142 | 2260 | 2385 | 2622 | 2858 | 2858 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 1259 | 1328 | 1405 | 1481 | 1551 | 1627 | 1704 | 1780 | 1850 | 2003 | 2149 | 2149 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .06 | \$ 1328 | 1398 | 1474 | 1551 | 1620 | 1697 | 1773 | 1850 | 1919 | 2072 | 2219 | 2219 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1398 | 1467 | 1544 | 1620 | 1690 | 1766 | 1843 | 1919 | 1989 | 2142 | 2288 | 2288 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .08 | \$ 1474 | 1544 | 1620 | 1697 | 1766 | 1843 | 1919 | 1996 | 2065 | 2219 | 2365 | 2365 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .09 | \$ 1544 | 1613 | 1690 | 1766 | 1836 | 1913 | 1989 | 2065 | 2135 | 2288 | 2434 | 2434 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .10 | \$ 1613 | 1683 | 1759 | 1836 | 1905 | 1983 | 2059 | 2135 | 2205 | 2358 | 2504 | 2504 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .12 | \$ 1759 | 1829 | 1905 | 1982 | 2052 | 2128 | 2205 | 2281 | 2351 | 2504 | 2650 | 2650 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .14 | \$ 1905 | 1975 | 2052 | 2128 | 2198 | 2274 | 2351 | 2427 | 2497 | 2650 | 2796 | 2796 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .16 | \$ 2045 | 2114 | 2191 | 2267 | 2337 | 2413 | 2490 | 2566 | 2636 | 2789 | 2935 | 2935 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| 90,000 | \$ 1606 | 1739 | 1878 | 2010 | 2142 | 2281 | 2413 | 2545 | 2678 | 2949 | 3220 | 3220 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 1460 | 1558 | 1655 | 1759 | 1857 | 1954 | 2052 | 2156 | 2253 | 2448 | 2650 | 2650 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .06 | \$ 1516 | 1613 | 1711 | 1815 | 1912 | 2010 | 2107 | 2212 | 2308 | 2504 | 2705 | 2705 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1572 | 1669 | 1766 | 1871 | 1968 | 2065 | 2163 | 2267 | 2365 | 2559 | 2761 | 2761 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .08 | \$ 1627 | 1725 | 1822 | 1926 | 2024 | 2124 | 2219 | 2323 | 2420 | 2615 | 2817 | 2817 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .09 | \$ 1676 | 1773 | 1871 | 1975 | 2072 | 2170 | 2267 | 2372 | 2469 | 2664 | 2865 | 2865 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .10 | \$ 1732 | 1829 | 1926 | 2031 | 2128 | 2225 | 2323 | 2427 | 2525 | 2719 | 2921 | 2921 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 48UHPQA INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH(95) 50000 SEER10.50
 ARI RATED HEATING CAP.: BTUH (47) 48000 COP(47) 3.20, HSPP 7.40 MIN.DHR REG IV
 BTUH (17) 29000, COP(17) 2.10
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
BTUH KILO-
 COST
 \$/KWH

70,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1238 | 2170 |
| .06 | S | 1488 | 2601 |
| .07 | S | 1739 | 3039 |
| .08 | S | 1982 | 3471 |
| .09 | S | 2232 | 3902 |
| .10 | S | 2476 | 4340 |
| .12 | S | 2977 | 5210 |
| .14 | S | 3471 | 6079 |
| .16 | S | 3965 | 6942 |

BALANCE POINT 22 DEG.F.

80,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1453 | 2476 |
| .06 | S | 1739 | 2977 |
| .07 | S | 2031 | 3471 |
| .08 | S | 2323 | 3965 |
| .09 | S | 2608 | 4465 |
| .10 | S | 2900 | 4959 |
| .12 | S | 3485 | 5954 |
| .14 | S | 4062 | 6942 |
| .16 | S | 4639 | 7936 |

BALANCE POINT 26 DEG.F.

90,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1676 | 2789 |
| .06 | S | 2017 | 3345 |
| .07 | S | 2351 | 3902 |
| .08 | S | 2692 | 4465 |
| .09 | S | 3018 | 5022 |
| .10 | S | 3359 | 5578 |
| .12 | S | 4034 | 6698 |
| .14 | S | 4709 | 7811 |
| .16 | S | 5377 | 8931 |

BALANCE POINT 29 DEG.F.

100,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|------|
| .05 | S | 1919 | 3095 |
| .06 | S | 2295 | 3721 |
| .07 | S | 2678 | 4340 |
| .08 | S | 3060 | 4959 |
| .09 | S | 3450 | 5578 |
| .10 | S | 3832 | 6197 |
| .12 | S | 4598 | 7443 |
| .14 | S | 5363 | 8681 |
| .16 | S | 6135 | 9926 |

BALANCE POINT 32 DEG.F.

110,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|---|------|-------|
| .05 | S | 2170 | 3408 |
| .06 | S | 2608 | 4090 |
| .07 | S | 3039 | 4771 |
| .08 | S | 3478 | 5453 |
| .09 | S | 3909 | 6135 |
| .10 | S | 4347 | 6823 |
| .12 | S | 5210 | 8187 |
| .14 | S | 6086 | 9550 |
| .16 | S | 6949 | 10914 |

BALANCE POINT 34 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
| S | 95 | 114 | 133 | 152 | 171 | 190 | 228 | 266 | 304 |

<--ELECTRIC RATE \$/KWH

<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 48UHPOA/A61AO-A
 HEAT PUMP MODEL: OUTDOOR 48UHPOA INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH (95) 50000, SEER10.50
 ARI RATED HEATING CAP.: BTUH (47) 48000, COP (47) 3.20, BSPF 7.40 MIN.DHR REG IV
 BTUH (17) 29000, COP (17) 2.10
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 |
|-------------------|-------------------------|---------|------|------|------|------|------|------|------|------|------|-------------------------|---|
| 50,000 | \$ 473 | 542 | 605 | 674 | 744 | 813 | 876 | 946 | 1015 | 1085 | 1217 | 1356 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 646 | 667 | 688 | 709 | 730 | 751 | 772 | 793 | 813 | 834 | 876 | 918 |
| | .06 | \$ 744 | 765 | 786 | 806 | 827 | 848 | 869 | 890 | 911 | 932 | 973 | 1015 |
| | .07 | \$ 841 | 862 | 883 | 904 | 925 | 946 | 966 | 987 | 1008 | 1029 | 1071 | 1112 |
| | .08 | \$ 946 | 966 | 987 | 1008 | 1029 | 1050 | 1071 | 1092 | 1112 | 1133 | 1175 | 1217 |
| | .09 | \$ 1043 | 1064 | 1085 | 1106 | 1126 | 1147 | 1168 | 1189 | 1210 | 1231 | 1272 | 1314 |
| | .10 | \$ 1140 | 1161 | 1203 | 1224 | 1245 | 1266 | 1286 | 1307 | 1328 | 1370 | 1412 | |
| | .12 | \$ 1342 | 1363 | 1384 | 1405 | 1426 | 1446 | 1467 | 1488 | 1509 | 1530 | 1572 | 1613 |
| | .14 | \$ 1537 | 1558 | 1579 | 1599 | 1620 | 1641 | 1662 | 1683 | 1704 | 1725 | 1766 | 1808 |
| | .16 | \$ 1739 | 1759 | 1780 | 1801 | 1822 | 1843 | 1864 | 1885 | 1905 | 1926 | 1968 | 2010 |
| | | | | | | | | | | | | BALANCE POINT 13 DEG.F. | |
| 60,000 | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 730 | 758 | 793 | 820 | 855 | 890 | 918 | 952 | 987 | 1015 | 1085 | 1147 |
| | .06 | \$ 834 | 862 | 897 | 925 | 959 | 994 | 1022 | 1057 | 1092 | 1119 | 1189 | 1252 |
| | .07 | \$ 932 | 959 | 994 | 1022 | 1057 | 1092 | 1119 | 1154 | 1189 | 1217 | 1286 | 1349 |
| | .08 | \$ 1036 | 1064 | 1099 | 1126 | 1161 | 1196 | 1224 | 1259 | 1293 | 1321 | 1391 | 1453 |
| | .09 | \$ 1133 | 1161 | 1196 | 1224 | 1259 | 1293 | 1321 | 1356 | 1391 | 1419 | 1488 | 1551 |
| | .10 | \$ 1238 | 1266 | 1300 | 1328 | 1363 | 1398 | 1426 | 1460 | 1495 | 1523 | 1592 | 1655 |
| | .12 | \$ 1439 | 1467 | 1502 | 1530 | 1565 | 1599 | 1627 | 1662 | 1697 | 1725 | 1794 | 1857 |
| | .14 | \$ 1634 | 1662 | 1697 | 1725 | 1759 | 1794 | 1822 | 1857 | 1892 | 1919 | 1989 | 2052 |
| | .16 | \$ 1838 | 1864 | 1899 | 1926 | 1961 | 1996 | 2024 | 2059 | 2093 | 2121 | 2191 | 2253 |
| | | | | | | | | | | | | BALANCE POINT 17 DEG.F. | |
| 70,000 | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 799 | 848 | 897 | 946 | 994 | 1043 | 1085 | 1133 | 1182 | 1231 | 1328 | 1426 |
| | .06 | \$ 897 | 946 | 994 | 1043 | 1092 | 1140 | 1182 | 1231 | 1279 | 1328 | 1426 | 1523 |
| | .07 | \$ 987 | 1036 | 1085 | 1133 | 1182 | 1231 | 1272 | 1321 | 1370 | 1419 | 1516 | 1613 |
| | .08 | \$ 1078 | 1126 | 1175 | 1224 | 1272 | 1321 | 1363 | 1412 | 1460 | 1509 | 1606 | 1704 |
| | .09 | \$ 1175 | 1224 | 1272 | 1321 | 1370 | 1419 | 1460 | 1509 | 1558 | 1606 | 1704 | 1801 |
| | .10 | \$ 1266 | 1314 | 1363 | 1412 | 1460 | 1509 | 1551 | 1599 | 1648 | 1697 | 1794 | 1892 |
| | .12 | \$ 1453 | 1502 | 1551 | 1599 | 1648 | 1697 | 1739 | 1787 | 1836 | 1885 | 1982 | 2079 |
| | .14 | \$ 1641 | 1690 | 1739 | 1787 | 1836 | 1885 | 1926 | 1975 | 2024 | 2072 | 2170 | 2267 |
| | .16 | \$ 1829 | 1878 | 1926 | 1975 | 2024 | 2072 | 2114 | 2163 | 2212 | 2260 | 2358 | 2455 |
| | | | | | | | | | | | | BALANCE POINT 22 DEG.F. | |
| 80,000 | \$ 758 | 862 | 973 | 1085 | 1189 | 1300 | 1405 | 1516 | 1627 | 1732 | 1947 | 2170 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 904 | 959 | 1015 | 1071 | 1126 | 1175 | 1231 | 1286 | 1342 | 1398 | 1509 | 1613 |
| | .06 | \$ 1008 | 1064 | 1119 | 1175 | 1231 | 1279 | 1335 | 1391 | 1446 | 1502 | 1613 | 1718 |
| | .07 | \$ 1112 | 1168 | 1224 | 1279 | 1335 | 1384 | 1439 | 1495 | 1551 | 1606 | 1718 | 1822 |
| | .08 | \$ 1217 | 1272 | 1328 | 1384 | 1439 | 1488 | 1544 | 1599 | 1655 | 1711 | 1822 | 1926 |
| | .09 | \$ 1321 | 1377 | 1432 | 1488 | 1544 | 1592 | 1648 | 1704 | 1759 | 1815 | 1926 | 2031 |
| | .10 | \$ 1426 | 1481 | 1537 | 1592 | 1648 | 1697 | 1752 | 1808 | 1864 | 1919 | 2031 | 2135 |
| | .12 | \$ 1634 | 1690 | 1745 | 1801 | 1857 | 1905 | 1961 | 2017 | 2072 | 2128 | 2239 | 2344 |
| | .14 | \$ 1843 | 1899 | 1954 | 2010 | 2065 | 2114 | 2170 | 2225 | 2281 | 2337 | 2448 | 2552 |
| | .16 | \$ 2052 | 2107 | 2163 | 2219 | 2274 | 2323 | 2379 | 2434 | 2490 | 2545 | 2657 | 2761 |
| | | | | | | | | | | | | BALANCE POINT 26 DEG.F. | |
| 90,000 | \$ 848 | 973 | 1099 | 1217 | 1342 | 1460 | 1586 | 1704 | 1829 | 1947 | 2198 | 2441 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 966 | 1043 | 1119 | 1196 | 1272 | 1349 | 1426 | 1502 | 1572 | 1648 | 1801 | 1954 |
| | .06 | \$ 1050 | 1126 | 1203 | 1279 | 1356 | 1432 | 1509 | 1586 | 1655 | 1732 | 1885 | 2038 |
| | .07 | \$ 1140 | 1217 | 1293 | 1370 | 1446 | 1523 | 1599 | 1676 | 1745 | 1822 | 1975 | 2128 |
| | .08 | \$ 1224 | 1300 | 1377 | 1453 | 1530 | 1606 | 1683 | 1759 | 1829 | 1905 | 2059 | 2212 |
| | .09 | \$ 1314 | 1391 | 1467 | 1544 | 1620 | 1697 | 1773 | 1850 | 1919 | 1996 | 2126 | 2302 |
| | .10 | \$ 1398 | 1474 | 1551 | 1627 | 1704 | 1780 | 1857 | 1933 | 2003 | 2079 | 2232 | 2385 |
| | .12 | \$ 1572 | 1648 | 1725 | 1801 | 1878 | 1954 | 2031 | 2107 | 2177 | 2253 | 2406 | 2559 |
| | .14 | \$ 1745 | 1822 | 1899 | 1975 | 2052 | 2128 | 2205 | 2281 | 2351 | 2427 | 2580 | 2733 |
| | .16 | \$ 1919 | 1996 | 2072 | 2149 | 2225 | 2302 | 2379 | 2455 | 2525 | 2601 | 2754 | 2907 |
| | | | | | | | | | | | | BALANCE POINT 29 DEG.F. | |
| 100,000 | \$ 946 | 1085 | 1217 | 1356 | 1488 | 1627 | 1759 | 1899 | 2031 | 2170 | 2441 | 2712 | --THEORETICAL HEATING COST * FURNACE ONLY |
| | .05 | \$ 1029 | 1126 | 1231 | 1328 | 1426 | 1530 | 1627 | 1732 | 1829 | 1926 | 2128 | 2330 |
| | .06 | \$ 1092 | 1189 | 1293 | 1391 | 1488 | 1592 | 1690 | 1794 | 1892 | 1989 | 2191 | 2392 |
| | .07 | \$ 1154 | 1252 | 1356 | 1453 | 1551 | 1655 | 1752 | 1857 | 1954 | 2052 | 2253 | 2455 |
| | .08 | \$ 1224 | 1321 | 1426 | 1523 | 1620 | 1725 | 1822 | 1928 | 2024 | 2121 | 2323 | 2525 |
| | .09 | \$ 1384 | 1488 | 1586 | 1683 | 1787 | 1885 | 1989 | 2086 | 2184 | 2285 | 2387 | 2587 |
| | .10 | \$ 1349 | 1446 | 1551 | 1648 | 1745 | 1850 | 1947 | 2052 | 2149 | 2246 | 2448 | 2650 |
| | .12 | \$ 1481 | 1579 | 1683 | 1780 | 1878 | 1982 | 2079 | 2184 | 2281 | 2379 | 2580 | 2782 |
| | .14 | \$ 1606 | 1704 | 1808 | 1905 | 2003 | 2107 | 2205 | 2309 | 2406 | 2504 | 2705 | 2907 |
| | .16 | \$ 1739 | 1836 | 1940 | 2038 | 2135 | 2239 | 2337 | 2441 | 2538 | 2636 | 2838 | 3039 |
| | | | | | | | | | | | | BALANCE POINT 32 DEG.F. | |

INITIAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS STATED IN KILOWATT-HEATERS PER HOUR

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON LOCAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

S .05 .06 .07 .08 .09 .10 .12 .14 .16
 .95 114 133 152 171 190 228 256 304 <-ELECTRIC RATE \$/KWH
 <-THEORETICAL AIR CONDITIONING COST

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

| | | 48UHPOA/A61AO-A | | | | | | | | | | | | | | | |
|--|---|---|------|------|------|------|------|------|------|---------------------------------|------|------|------|---|------|------|------|
| REGION 5 | | HEAT PUMP MODEL: OUTDOOR 48UHPOA INDOOR A61AO-A | | | | | | | | 48UHPOA/A61AO-A | | | | | | | |
| ARI RATED COOLING CAP.: BTUH(95°) 50000 SEER10.50 | BTUH(47°) 48000 COP(47°) 3.20, BSPF 7.40 MIN.DHR REG IV | | | | | | | | | | | | | | | | |
| ARI RATED HEATING CAP.: BTUH(47°) 48000 COP(47°) 2.10 | BTUH(17°) 29000 COP(17°) 1.10 | | | | | | | | | FURNACE EFFICIENCY 78.00 % AFUE | | | | | | | |
| HEAT LOSS BTUH | KILO- COST \$/KWH | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | 1.90 | 2.00 | 2.10 | 2.20 |
| 50,000 | | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | | | |
| | | \$ 681 | 779 | 876 | 973 | 1071 | 1168 | 1266 | 1363 | 1467 | 1565 | 1662 | 1759 | <-THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 709 | 744 | 772 | 799 | 834 | 862 | 890 | 925 | 952 | 980 | 1015 | 1043 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | .06 | \$ 806 | 841 | 869 | 897 | 932 | 959 | 987 | 1022 | 1050 | 1078 | 1112 | 1140 | S PER YEAR | | | |
| | .07 | \$ 904 | 939 | 966 | 994 | 1029 | 1057 | 1085 | 1119 | 1147 | 1175 | 1210 | 1238 | | | | |
| | .08 | \$ 1008 | 1043 | 1071 | 1099 | 1133 | 1161 | 1189 | 1224 | 1252 | 1279 | 1314 | 1342 | | | | |
| | .09 | \$ 1106 | 1140 | 1168 | 1196 | 1231 | 1259 | 1286 | 1321 | 1349 | 1377 | 1412 | 1439 | | | | |
| | .10 | \$ 1203 | 1238 | 1266 | 1293 | 1328 | 1356 | 1384 | 1419 | 1446 | 1474 | 1509 | 1537 | | | | |
| | .12 | \$ 1405 | 1439 | 1467 | 1495 | 1530 | 1558 | 1586 | 1620 | 1648 | 1676 | 1711 | 1739 | | | | |
| | .14 | \$ 1599 | 1634 | 1662 | 1690 | 1725 | 1752 | 1780 | 1815 | 1843 | 1871 | 1905 | 1933 | BALANCE POINT 13 DEG.F. | | | |
| | .16 | \$ 1801 | 1836 | 1864 | 1892 | 1926 | 1954 | 1982 | 2017 | 2045 | 2072 | 2107 | 2135 | | | | |
| 60,000 | | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | <-THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 827 | 876 | 918 | 966 | 1015 | 1057 | 1106 | 1154 | 1196 | 1245 | 1293 | 1342 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | .06 | \$ 932 | 980 | 1022 | 1071 | 1119 | 1161 | 1210 | 1259 | 1300 | 1349 | 1398 | 1446 | S PER YEAR | | | |
| | .07 | \$ 1029 | 1078 | 1119 | 1168 | 1217 | 1259 | 1307 | 1356 | 1398 | 1446 | 1495 | 1544 | | | | |
| | .08 | \$ 1133 | 1182 | 1224 | 1272 | 1321 | 1363 | 1412 | 1460 | 1502 | 1551 | 1599 | 1648 | | | | |
| | .09 | \$ 1231 | 1279 | 1321 | 1370 | 1419 | 1460 | 1509 | 1558 | 1599 | 1648 | 1697 | 1745 | | | | |
| | .10 | \$ 1335 | 1384 | 1426 | 1474 | 1523 | 1565 | 1613 | 1662 | 1704 | 1752 | 1801 | 1850 | | | | |
| | .12 | \$ 1537 | 1586 | 1627 | 1676 | 1725 | 1766 | 1815 | 1864 | 1905 | 1954 | 2003 | 2052 | BALANCE POINT 17 DEG.F. | | | |
| | .14 | \$ 1732 | 1780 | 1822 | 1871 | 1919 | 1961 | 2010 | 2059 | 2100 | 2149 | 2198 | 2246 | | | | |
| | .16 | \$ 1933 | 1982 | 2024 | 2072 | 2121 | 2163 | 2212 | 2260 | 2302 | 2351 | 2399 | 2448 | | | | |
| 70,000 | | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | <-THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 946 | 1015 | 1085 | 1154 | 1224 | 1293 | 1363 | 1432 | 1502 | 1572 | 1641 | 1711 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | .06 | \$ 1043 | 1112 | 1182 | 1252 | 1321 | 1391 | 1460 | 1530 | 1599 | 1669 | 1739 | 1808 | S PER YEAR | | | |
| | .07 | \$ 1133 | 1203 | 1272 | 1342 | 1412 | 1481 | 1551 | 1620 | 1690 | 1759 | 1829 | 1899 | | | | |
| | .08 | \$ 1224 | 1293 | 1363 | 1432 | 1502 | 1572 | 1641 | 1711 | 1780 | 1850 | 1919 | 1989 | | | | |
| | .09 | \$ 1321 | 1391 | 1460 | 1530 | 1599 | 1669 | 1739 | 1808 | 1878 | 1947 | 2017 | 2086 | BALANCE POINT 22 DEG.F. | | | |
| | .10 | \$ 1412 | 1481 | 1551 | 1620 | 1690 | 1759 | 1829 | 1899 | 1968 | 2038 | 2107 | 2177 | | | | |
| | .12 | \$ 1599 | 1662 | 1739 | 1808 | 1878 | 1947 | 2017 | 2086 | 2156 | 2225 | 2295 | 2365 | | | | |
| | .14 | \$ 1787 | 1857 | 1926 | 1996 | 2065 | 2135 | 2205 | 2274 | 2344 | 2413 | 2483 | 2552 | | | | |
| | .16 | \$ 1975 | 2045 | 2114 | 2184 | 2253 | 2323 | 2392 | 2462 | 2532 | 2601 | 2671 | 2740 | | | | |
| 80,000 | | \$ 1092 | 1252 | 1405 | 1565 | 1718 | 1878 | 2031 | 2191 | 2344 | 2504 | 2657 | 2817 | <-THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 1071 | 1154 | 1231 | 1307 | 1391 | 1467 | 1544 | 1627 | 1704 | 1787 | 1864 | 1940 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | .06 | \$ 1175 | 1259 | 1335 | 1412 | 1495 | 1572 | 1648 | 1732 | 1808 | 1892 | 1968 | 2045 | S PER YEAR | | | |
| | .07 | \$ 1279 | 1363 | 1439 | 1516 | 1599 | 1676 | 1752 | 1836 | 1912 | 1996 | 2072 | 2149 | | | | |
| | .08 | \$ 1384 | 1461 | 1544 | 1620 | 1704 | 1780 | 1857 | 1940 | 2017 | 2100 | 2177 | 2253 | BALANCE POINT 26 DEG.F. | | | |
| | .09 | \$ 1488 | 1572 | 1648 | 1725 | 1808 | 1885 | 1961 | 2045 | 2121 | 2205 | 2281 | 2358 | | | | |
| | .10 | \$ 1592 | 1676 | 1752 | 1828 | 1912 | 1989 | 2065 | 2149 | 2225 | 2309 | 2385 | 2462 | | | | |
| | .12 | \$ 1801 | 1885 | 1961 | 2038 | 2121 | 2198 | 2274 | 2358 | 2434 | 2518 | 2594 | 2671 | | | | |
| | .14 | \$ 2010 | 2093 | 2170 | 2246 | 2330 | 2406 | 2483 | 2566 | 2643 | 2726 | 2803 | 2879 | | | | |
| | .16 | \$ 2219 | 2302 | 2379 | 2455 | 2538 | 2615 | 2692 | 2775 | 2852 | 2935 | 3012 | 3088 | | | | |
| 90,000 | | \$ 1231 | 1405 | 1579 | 1759 | 1933 | 2107 | 2288 | 2462 | 2636 | 2817 | 2991 | 3165 | <-THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 1203 | 1314 | 1419 | 1530 | 1641 | 1752 | 1864 | 1968 | 2079 | 2191 | 2302 | 2413 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | .06 | \$ 1286 | 1398 | 1502 | 1613 | 1725 | 1836 | 1947 | 2052 | 2163 | 2274 | 2385 | 2497 | S PER YEAR | | | |
| | .07 | \$ 1377 | 1488 | 1592 | 1704 | 1815 | 1926 | 2038 | 2142 | 2253 | 2365 | 2476 | 2587 | | | | |
| | .08 | \$ 1460 | 1572 | 1676 | 1787 | 1899 | 2010 | 2121 | 2225 | 2337 | 2448 | 2559 | 2671 | BALANCE POINT 29 DEG.F. | | | |
| | .09 | \$ 1551 | 1662 | 1766 | 1878 | 1989 | 2100 | 2212 | 2316 | 2427 | 2538 | 2650 | 2761 | | | | |
| | .10 | \$ 1634 | 1745 | 1850 | 1961 | 2072 | 2184 | 2295 | 2399 | 2511 | 2622 | 2733 | 2845 | | | | |
| | .12 | \$ 1808 | 1919 | 2024 | 2124 | 2246 | 2358 | 2469 | 2573 | 2685 | 2796 | 2907 | 3018 | | | | |
| | .14 | \$ 1982 | 2093 | 2198 | 2309 | 2420 | 2532 | 2643 | 2747 | 2858 | 2970 | 3081 | 3192 | | | | |
| | .16 | \$ 2156 | 2267 | 2372 | 2483 | 2594 | 2705 | 2817 | 2921 | 3032 | 3144 | 3255 | 3366 | | | | |
| 100,000 | | \$ 1363 | 1565 | 1759 | 1954 | 2149 | 2344 | 2538 | 2733 | 2935 | 3130 | 3325 | 3519 | <-THEORETICAL HEATING COST * FURNACE ONLY | | | |
| | .05 | \$ 1335 | 1481 | 1627 | 1773 | 1912 | 2059 | 2205 | 2351 | 2490 | 2636 | 2782 | 2928 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP | | | |
| | .06 | \$ 1398 | 1544 | 1650 | 1836 | 1975 | 2121 | 2267 | 2413 | 2552 | 2698 | 2845 | 2991 | S PER YEAR | | | |
| | .07 | \$ 1460 | 1606 | 1752 | 1899 | 2038 | 2184 | 2330 | 2476 | 2615 | 2761 | 2907 | 3053 | | | | |
| | .08 | \$ 1530 | 1676 | 1822 | 1968 | 2107 | 2253 | 2399 | 2545 | 2685 | 2831 | 2977 | 3123 | BALANCE POINT 32 DEG.F. | | | |
| | .09 | \$ 1592 | 1739 | 1888 | 2031 | 2170 | 2316 | 2462 | 2608 | 2747 | 2893 | 3039 | 3185 | | | | |
| | .10 | \$ 1655 | 1801 | 1947 | 2093 | 2232 | 2379 | 2525 | 2671 | 2810 | 2956 | 3102 | 3248 | | | | |
| | .12 | \$ 1781 | 1933 | 2079 | 2225 | 2365 | 2511 | 2657 | 2803 | 2942 | 3088 | 3234 | 3380 | | | | |
| | .14 | \$ 1912 | 2059 | 2205 | 2351 | 2490 | 2636 | 2782 | 2928 | 3067 | 3213 | 3359 | 3505 | | | | |

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 **48UEPQA/A61AO-A**
HEAT PUMP MODEL: OUTDOOR 48UEPQA INDOOR A61AO-A
ARI RATED COOLING CAP.: BTUH (95°) 50000 SEER10.50
ARI RATED HEATING CAP.: BTUH (47°) 48000 COP(47°) 3.20, BSPE 7.40 MIN.DHR REG IV
BTUH (17°) 29000 COP(17°) 2.10
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | PROPANE GAS COST - \$/GALLON | | | | | | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|--|------|------|------|--|--|
| | | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | | |
| 50,000 | \$ 890 | 966 | 1043 | 1112 | 1189 | 1266 | 1335 | 1412 | 1488 | 1634 | 1787 | 1787 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | | | |

| | | | | | | | | | | | | | | | | | | |
|-----|---------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| .05 | \$ 779 | 799 | 820 | 841 | 869 | 890 | 911 | 939 | 959 | 1008 | 1050 | 1050 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | | | |
| .06 | \$ 876 | 897 | 918 | 939 | 966 | 987 | 1008 | 1036 | 1057 | 1106 | 1147 | 1147 | | | | | | |
| .07 | \$ 973 | 994 | 1015 | 1036 | 1064 | 1085 | 1106 | 1133 | 1154 | 1203 | 1245 | 1245 | | | | | | |
| .08 | \$ 1078 | 1099 | 1119 | 1140 | 1168 | 1189 | 1210 | 1238 | 1259 | 1307 | 1349 | 1349 | | | | | | |
| .09 | \$ 1175 | 1196 | 1217 | 1238 | 1266 | 1286 | 1307 | 1335 | 1356 | 1405 | 1446 | 1446 | | | | | | |
| .10 | \$ 1272 | 1293 | 1314 | 1335 | 1363 | 1384 | 1405 | 1432 | 1453 | 1502 | 1544 | 1544 | | | | | | |
| .12 | \$ 1474 | 1495 | 1516 | 1537 | 1565 | 1586 | 1606 | 1634 | 1655 | 1704 | 1745 | 1745 | | | | | | |
| .14 | \$ 1669 | 1690 | 1711 | 1732 | 1759 | 1780 | 1801 | 1829 | 1850 | 1899 | 1940 | 1940 | | | | | | |
| .16 | \$ 1871 | 1892 | 1912 | 1933 | 1961 | 1982 | 2003 | 2031 | 2052 | 2100 | 2142 | 2142 | BALANCE POINT 13 DEG.F. | | | | | |

| | | | | | | | | | | | | | | | | | | |
|--------|---------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| 60,000 | \$ 1071 | 1161 | 1252 | 1335 | 1426 | 1516 | 1606 | 1697 | 1787 | 1968 | 2142 | 2142 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | | | |
| .05 | \$ 925 | 959 | 994 | 1036 | 1071 | 1106 | 1140 | 1175 | 1210 | 1279 | 1349 | 1349 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | | | |
| .06 | \$ 1029 | 1064 | 1099 | 1140 | 1175 | 1210 | 1245 | 1279 | 1314 | 1384 | 1453 | 1453 | | | | | | |
| .07 | \$ 1126 | 1161 | 1196 | 1238 | 1272 | 1307 | 1342 | 1377 | 1412 | 1481 | 1551 | 1551 | | | | | | |
| .08 | \$ 1231 | 1266 | 1300 | 1342 | 1377 | 1412 | 1446 | 1481 | 1516 | 1586 | 1655 | 1655 | | | | | | |
| .09 | \$ 1328 | 1363 | 1398 | 1439 | 1474 | 1509 | 1544 | 1579 | 1613 | 1683 | 1754 | 1754 | | | | | | |
| .10 | \$ 1432 | 1467 | 1502 | 1544 | 1579 | 1613 | 1648 | 1683 | 1718 | 1787 | 1857 | 1857 | | | | | | |
| .12 | \$ 1634 | 1669 | 1704 | 1745 | 1780 | 1815 | 1850 | 1885 | 1919 | 1989 | 2059 | 2059 | | | | | | |
| .14 | \$ 1829 | 1864 | 1899 | 1940 | 1975 | 2010 | 2045 | 2079 | 2114 | 2184 | 2253 | 2253 | | | | | | |
| .16 | \$ 2031 | 2065 | 2100 | 2142 | 2177 | 2212 | 2246 | 2281 | 2316 | 2385 | 2455 | 2455 | BALANCE POINT 17 DEG.F. | | | | | |

| | | | | | | | | | | | | | | | | | | |
|--------|---------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| 70,000 | \$ 1252 | 1356 | 1460 | 1565 | 1669 | 1773 | 1878 | 1982 | 2086 | 2295 | 2504 | 2504 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | | | |
| .05 | \$ 1099 | 1147 | 1203 | 1252 | 1307 | 1363 | 1412 | 1467 | 1516 | 1620 | 1732 | 1732 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | | | |
| .06 | \$ 1196 | 1245 | 1300 | 1349 | 1405 | 1460 | 1509 | 1565 | 1613 | 1718 | 1829 | 1829 | | | | | | |
| .07 | \$ 1286 | 1335 | 1391 | 1439 | 1495 | 1551 | 1599 | 1655 | 1704 | 1808 | 1919 | 1919 | | | | | | |
| .08 | \$ 1377 | 1426 | 1481 | 1530 | 1586 | 1641 | 1690 | 1745 | 1794 | 1899 | 2010 | 2010 | | | | | | |
| .09 | \$ 1474 | 1523 | 1579 | 1627 | 1683 | 1739 | 1787 | 1843 | 1892 | 1996 | 2107 | 2107 | | | | | | |
| .10 | \$ 1565 | 1613 | 1669 | 1718 | 1773 | 1829 | 1878 | 1933 | 1982 | 2086 | 2198 | 2198 | | | | | | |
| .12 | \$ 1752 | 1801 | 1857 | 1905 | 1961 | 2017 | 2065 | 2121 | 2170 | 2274 | 2385 | 2385 | | | | | | |
| .14 | \$ 1940 | 1989 | 2045 | 2093 | 2149 | 2205 | 2253 | 2309 | 2358 | 2462 | 2573 | 2573 | | | | | | |
| .16 | \$ 2128 | 2177 | 2232 | 2281 | 2337 | 2392 | 2441 | 2497 | 2545 | 2650 | 2761 | 2761 | BALANCE POINT 22 DEG.F. | | | | | |

| | | | | | | | | | | | | | | | | | | |
|--------|---------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| 80,000 | \$ 1426 | 1551 | 1669 | 1787 | 1905 | 2024 | 2142 | 2260 | 2385 | 2622 | 2858 | 2858 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | | | |
| .05 | \$ 1245 | 1300 | 1363 | 1426 | 1481 | 1544 | 1606 | 1662 | 1725 | 1843 | 1961 | 1961 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | | | |
| .06 | \$ 1349 | 1405 | 1467 | 1530 | 1586 | 1648 | 1711 | 1766 | 1829 | 1947 | 2065 | 2065 | | | | | | |
| .07 | \$ 1453 | 1509 | 1572 | 1634 | 1690 | 1752 | 1815 | 1871 | 1933 | 2052 | 2170 | 2170 | | | | | | |
| .08 | \$ 1558 | 1613 | 1676 | 1739 | 1794 | 1857 | 1919 | 1975 | 2038 | 2156 | 2274 | 2274 | | | | | | |
| .09 | \$ 1662 | 1718 | 1780 | 1843 | 1899 | 1961 | 2024 | 2079 | 2142 | 2260 | 2379 | 2379 | | | | | | |
| .10 | \$ 1766 | 1822 | 1885 | 1947 | 2003 | 2065 | 2128 | 2184 | 2246 | 2365 | 2483 | 2483 | | | | | | |
| .12 | \$ 1975 | 2031 | 2093 | 2156 | 2212 | 2274 | 2337 | 2392 | 2455 | 2573 | 2692 | 2692 | | | | | | |
| .14 | \$ 2184 | 2239 | 2302 | 2365 | 2420 | 2483 | 2545 | 2601 | 2664 | 2782 | 2900 | 2900 | | | | | | |
| .16 | \$ 2392 | 2448 | 2511 | 2573 | 2629 | 2692 | 2754 | 2810 | 2872 | 2991 | 3109 | 3109 | BALANCE POINT 26 DEG.F. | | | | | |

| | | | | | | | | | | | | | | | | | | |
|--------|---------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| 90,000 | \$ 1606 | 1739 | 1878 | 2010 | 2142 | 2281 | 2413 | 2545 | 2678 | 2949 | 3220 | 3220 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | | | |
| .05 | \$ 1439 | 1523 | 1606 | 1690 | 1773 | 1857 | 1940 | 2024 | 2107 | 2274 | 2441 | 2441 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | | | |
| .06 | \$ 1523 | 1606 | 1690 | 1773 | 1857 | 1940 | 2024 | 2107 | 2191 | 2358 | 2525 | 2525 | | | | | | |
| .07 | \$ 1613 | 1697 | 1780 | 1864 | 1947 | 2031 | 2114 | 2198 | 2281 | 2448 | 2615 | 2615 | | | | | | |
| .08 | \$ 1697 | 1780 | 1864 | 1947 | 2031 | 2114 | 2198 | 2281 | 2365 | 2532 | 2698 | 2698 | | | | | | |
| .09 | \$ 1787 | 1871 | 1954 | 2038 | 2121 | 2205 | 2288 | 2372 | 2455 | 2622 | 2789 | 2789 | | | | | | |
| .10 | \$ 1871 | 1954 | 2038 | 2121 | 2205 | 2288 | 2372 | 2455 | 2538 | 2705 | 2872 | 2872 | | | | | | |
| .12 | \$ 2045 | 2128 | 2212 | 2295 | 2379 | 2462 | 2545 | 2629 | 2712 | 2879 | 3046 | 3046 | | | | | | |
| .14 | \$ 2219 | 2302 | 2385 | 2469 | 2552 | 2636 | 2719 | 2803 | 2886 | 3053 | 3220 | 3220 | | | | | | |
| .16 | \$ 2392 | 2476 | 2559 | 2643 | 2726 | 2810 | 2893 | 2977 | 3060 | 3221 | 3394 | 3394 | BALANCE POINT 29 DEG.F. | | | | | |

| | | | | | | | | | | | | | | | | | | |
|---------|---------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| 100,000 | \$ 1787 | 1933 | 2086 | 2232 | 2385 | 2532 | 2678 | 2831 | 2977 | 3276 | 3575 | 3575 | <--THEORETICAL HEATING COST * FURNACE ONLY | | | | | |
| .05 | \$ 1648 | 1759 | 1871 | 1975 | 2086 | 2198 | 2309 | 2420 | 2525 | 2747 | 2970 | 2970 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | | | |
| .06 | \$ 1711 | 1822 | 1933 | 2038 | 2149 | 2260 | 2372 | 2483 | 2587 | 2810 | 3032 | 3032 | | | | | | |
| .07 | \$ 1773 | 1885 | 1996 | 2100 | 2212 | 2323 | 2434 | 2545 | 2650 | 2872 | 3095 | 3095 | | | | | | |
| .08 | \$ 1843 | 1954 | 2065 | 2170 | 2281 | 2392 | 2504 | 2615 | 2719 | 2942 | 3165 | 3165 | | | | | | |
| .09 | \$ 1905 | 2017 | 2128 | 2232 | 2344 | 2455 | 2566 | 2678 | 2782 | 3005 | 3227 | 3227 | | | | | | |
| .10 | \$ 1968 | 2079 | 2191 | 2295 | 2406 | 2518 | 2629 | 2740 | 2845 | 3067 | 3290 | 3290 | | | | | | |
| .12 | \$ 2109 | 2214 | 2323 | 2427 | 2538 | 2650 | 2761 | 2872 | 2977 | 3199 | 3422 | 3422 | | | | | | |
| .14 | \$ 2225 | 2337 | 2448 | 2552 | 2664 | 2775 | 2886 | 2998 | 3102 | 3325 | 3541 | 3541 | | | | | | |
| .16 | \$ 2358 | 2469 | 2580 | 2685 | 2796 | 2907 | 3018 | 3130 | 3234 | 3457 | 3679 | 3679 | BALANCE POINT 32 DEG.F. | | | | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| S | .95 | 114 | 133 | 152 | 171 | 190 | 228 | 266 | 304 |

| <--ELECTRIC RATE \$/KWH | | | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <--THEORETICAL AIR CONDITIONING COST | | | | | | | | | |
| S | .05 | .06 | .07 | .08 | .09 | .10 | .12 | .14 | .16 |

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 60UHPOA INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70
 ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, RSPP 7.50 MIN.DHR RBC IV
 BTUH (17) 35500, COP(17) 2.20
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
BTUH ELEC.
 COST
 \$/KWH

80,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1370 | 2476 |
| .06 | \$ | 1641 | 2977 |
| .07 | \$ | 1912 | 3471 |
| .08 | \$ | 2181 | 3965 |
| .09 | \$ | 2455 | 4465 |
| .10 | \$ | 2733 | 4959 |
| .12 | \$ | 3283 | 5954 |
| .14 | \$ | 3825 | 6942 |
| .16 | \$ | 4382 | 7936 |

BALANCE POINT 19 DEG.F.

90,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1558 | 2789 |
| .06 | \$ | 1878 | 3345 |
| .07 | \$ | 2184 | 3902 |
| .08 | \$ | 2504 | 4465 |
| .09 | \$ | 2810 | 5022 |
| .10 | \$ | 3130 | 5578 |
| .12 | \$ | 3756 | 6698 |
| .14 | \$ | 4382 | 7811 |
| .16 | \$ | 5008 | 8931 |

BALANCE POINT 23 DEG.F.

100,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|------|
| .05 | \$ | 1773 | 3095 |
| .06 | \$ | 2128 | 3721 |
| .07 | \$ | 2483 | 4340 |
| .08 | \$ | 2838 | 4959 |
| .09 | \$ | 3192 | 5578 |
| .10 | \$ | 3547 | 6197 |
| .12 | \$ | 4257 | 7443 |
| .14 | \$ | 4966 | 8681 |
| .16 | \$ | 5676 | 9926 |

BALANCE POINT 25 DEG.F.

110,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|-------|
| .05 | \$ | 1989 | 3408 |
| .06 | \$ | 2385 | 4090 |
| .07 | \$ | 2789 | 4771 |
| .08 | \$ | 3192 | 5453 |
| .09 | \$ | 3589 | 6135 |
| .10 | \$ | 3985 | 6823 |
| .12 | \$ | 4785 | 8187 |
| .14 | \$ | 5578 | 9550 |
| .16 | \$ | 6378 | 10914 |

BALANCE POINT 28 DEG.F.

130,000 --- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

| | | | |
|-----|----|------|-------|
| .05 | \$ | 2462 | 4027 |
| .06 | \$ | 2949 | 4834 |
| .07 | \$ | 3443 | 5641 |
| .08 | \$ | 3937 | 6448 |
| .09 | \$ | 4431 | 7255 |
| .10 | \$ | 4924 | 8062 |
| .12 | \$ | 5905 | 9676 |
| .14 | \$ | 6893 | 11289 |
| .16 | \$ | 7874 | 12903 |

BALANCE POINT 32 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

| | | | | | | | | | | | | | | | | | |
|-----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|
| .05 | 108 | 06 | 130 | 07 | 151 | 08 | 173 | 09 | 195 | 10 | 216 | 12 | 260 | 14 | 303 | 16 | 346 |
|-----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|

<-ELECTRIC RATE \$/KWH
 <-THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 60UHPOA/A61AO-A
 HEAT PUMP MODEL: OUTDOOR 60UHPOA INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH(95) 58000 SEER10.70
 ARI RATED HEATING CAP.: BTUH (47) 61000 COP(47) 3.20, ESSP 7.50 MIN.DR. REG IV
 BTUH (17) 35500 COP(17) 2.20
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | NATURAL GAS COST - \$/THERM | | | | | | | | | | | |
|-------------------|-------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|-------------------------|
| | | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .90 | 1.00 |
| 60,000 | | \$ 563 | 646 | 730 | 813 | 890 | 973 | 1057 | 1133 | 1217 | 1300 | 1460 | 1627 |
| | .05 | \$ 744 | 772 | 793 | 820 | 848 | 869 | 897 | 918 | 946 | 973 | 1022 | 1071 |
| | .06 | \$ 855 | 883 | 904 | 932 | 959 | 980 | 1008 | 1029 | 1057 | 1085 | 1133 | 1182 |
| | .07 | \$ 973 | 1001 | 1022 | 1050 | 1078 | 1099 | 1126 | 1147 | 1175 | 1203 | 1252 | 1300 |
| | .08 | \$ 1085 | 1112 | 1133 | 1161 | 1189 | 1210 | 1238 | 1259 | 1286 | 1314 | 1363 | 1412 |
| | .09 | \$ 1196 | 1224 | 1245 | 1272 | 1300 | 1321 | 1349 | 1370 | 1398 | 1426 | 1474 | 1523 |
| | .10 | \$ 1314 | 1342 | 1363 | 1391 | 1419 | 1439 | 1467 | 1488 | 1516 | 1544 | 1592 | 1641 |
| | .12 | \$ 1544 | 1572 | 1592 | 1620 | 1648 | 1669 | 1697 | 1718 | 1745 | 1773 | 1822 | 1871 |
| | .14 | \$ 1766 | 1794 | 1815 | 1843 | 1871 | 1892 | 1919 | 1940 | 1968 | 1996 | 2045 | 2093 |
| | .16 | \$ 1996 | 2024 | 2045 | 2072 | 2100 | 2121 | 2149 | 2170 | 2198 | 2225 | 2274 | 2323 |
| | | | | | | | | | | | | | BALANCE POINT 12 DEG.F. |
| 70,000 | | \$ 660 | 758 | 848 | 946 | 1043 | 1133 | 1231 | 1328 | 1419 | 1516 | 1704 | 1899 |
| | .05 | \$ 848 | 883 | 911 | 939 | 966 | 994 | 1029 | 1057 | 1085 | 1112 | 1175 | 1231 |
| | .06 | \$ 980 | 1015 | 1043 | 1071 | 1099 | 1126 | 1161 | 1189 | 1217 | 1245 | 1307 | 1363 |
| | .07 | \$ 1112 | 1147 | 1175 | 1203 | 1231 | 1259 | 1293 | 1321 | 1349 | 1377 | 1439 | 1495 |
| | .08 | \$ 1238 | 1272 | 1300 | 1328 | 1356 | 1384 | 1419 | 1446 | 1474 | 1502 | 1565 | 1620 |
| | .09 | \$ 1370 | 1405 | 1432 | 1460 | 1488 | 1516 | 1551 | 1579 | 1606 | 1634 | 1697 | 1752 |
| | .10 | \$ 1502 | 1537 | 1565 | 1592 | 1620 | 1648 | 1683 | 1711 | 1739 | 1766 | 1829 | 1885 |
| | .12 | \$ 1759 | 1794 | 1822 | 1850 | 1878 | 1905 | 1940 | 1968 | 1996 | 2024 | 2086 | 2142 |
| | .14 | \$ 2024 | 2059 | 2086 | 2114 | 2142 | 2170 | 2205 | 2232 | 2260 | 2288 | 2351 | 2406 |
| | .16 | \$ 2281 | 2316 | 2344 | 2372 | 2399 | 2427 | 2462 | 2490 | 2518 | 2545 | 2608 | 2664 |
| | | | | | | | | | | | | | BALANCE POINT 16 DEG.F. |
| 80,000 | | \$ 758 | 862 | 973 | 1085 | 1189 | 1300 | 1405 | 1516 | 1627 | 1732 | 1947 | 2170 |
| | .05 | \$ 925 | 973 | 1015 | 1057 | 1099 | 1140 | 1182 | 1231 | 1272 | 1314 | 1398 | 1488 |
| | .06 | \$ 1050 | 1099 | 1140 | 1182 | 1224 | 1266 | 1307 | 1356 | 1398 | 1435 | 1523 | 1613 |
| | .07 | \$ 1182 | 1231 | 1272 | 1314 | 1356 | 1398 | 1439 | 1488 | 1530 | 1572 | 1655 | 1745 |
| | .08 | \$ 1307 | 1356 | 1398 | 1439 | 1481 | 1523 | 1565 | 1613 | 1655 | 1697 | 1780 | 1871 |
| | .09 | \$ 1432 | 1481 | 1523 | 1565 | 1606 | 1648 | 1690 | 1739 | 1780 | 1822 | 1905 | 1996 |
| | .10 | \$ 1558 | 1606 | 1648 | 1690 | 1732 | 1773 | 1815 | 1864 | 1905 | 1947 | 2031 | 2121 |
| | .12 | \$ 1808 | 1857 | 1899 | 1940 | 1982 | 2024 | 2065 | 2114 | 2156 | 2198 | 2281 | 2372 |
| | .14 | \$ 2059 | 2107 | 2149 | 2191 | 2232 | 2274 | 2316 | 2365 | 2406 | 2448 | 2532 | 2622 |
| | .16 | \$ 2309 | 2358 | 2399 | 2441 | 2483 | 2525 | 2566 | 2615 | 2657 | 2698 | 2782 | 2872 |
| | | | | | | | | | | | | | BALANCE POINT 19 DEG.F. |
| 90,000 | | \$ 848 | 973 | 1099 | 1217 | 1342 | 1460 | 1586 | 1704 | 1829 | 1947 | 2198 | 2441 |
| | .05 | \$ 994 | 1057 | 1119 | 1182 | 1238 | 1300 | 1363 | 1426 | 1488 | 1551 | 1669 | 1794 |
| | .06 | \$ 1112 | 1175 | 1238 | 1300 | 1356 | 1419 | 1481 | 1544 | 1606 | 1669 | 1787 | 1912 |
| | .07 | \$ 1224 | 1286 | 1349 | 1412 | 1467 | 1530 | 1592 | 1655 | 1718 | 1780 | 1899 | 2024 |
| | .08 | \$ 1335 | 1398 | 1460 | 1523 | 1579 | 1641 | 1704 | 1766 | 1829 | 1892 | 2010 | 2135 |
| | .09 | \$ 1446 | 1509 | 1572 | 1634 | 1690 | 1752 | 1815 | 1878 | 1940 | 2003 | 2121 | 2246 |
| | .10 | \$ 1565 | 1627 | 1690 | 1752 | 1808 | 1871 | 1933 | 1996 | 2059 | 2121 | 2239 | 2365 |
| | .12 | \$ 1787 | 1850 | 1912 | 1975 | 2031 | 2093 | 2156 | 2219 | 2281 | 2344 | 2462 | 2587 |
| | .14 | \$ 2017 | 2079 | 2142 | 2205 | 2260 | 2323 | 2385 | 2448 | 2511 | 2573 | 2692 | 2817 |
| | .16 | \$ 2239 | 2302 | 2365 | 2427 | 2483 | 2545 | 2608 | 2671 | 2733 | 2796 | 2914 | 3039 |
| | | | | | | | | | | | | | BALANCE POINT 23 DEG.F. |
| 100,000 | | \$ 946 | 1085 | 1217 | 1356 | 1488 | 1627 | 1759 | 1899 | 2031 | 2170 | 2441 | 2712 |
| | .05 | \$ 1099 | 1168 | 1238 | 1300 | 1370 | 1439 | 1509 | 1579 | 1648 | 1711 | 1850 | 1989 |
| | .06 | \$ 1224 | 1293 | 1363 | 1426 | 1495 | 1565 | 1634 | 1704 | 1773 | 1836 | 1975 | 2114 |
| | .07 | \$ 1342 | 1412 | 1481 | 1544 | 1613 | 1683 | 1752 | 1822 | 1892 | 1954 | 2093 | 2232 |
| | .08 | \$ 1467 | 1537 | 1606 | 1669 | 1739 | 1808 | 1878 | 1947 | 2017 | 2079 | 2219 | 2358 |
| | .09 | \$ 1597 | 1664 | 1734 | 1794 | 1864 | 1933 | 2003 | 2074 | 2142 | 2205 | 2344 | 2483 |
| | .10 | \$ 1718 | 1787 | 1851 | 1919 | 1989 | 2059 | 2128 | 2198 | 2267 | 2330 | 2469 | 2608 |
| | .12 | \$ 1961 | 2031 | 2100 | 2163 | 2232 | 2302 | 2372 | 2441 | 2511 | 2573 | 2712 | 2852 |
| | .14 | \$ 2212 | 2281 | 2351 | 2413 | 2483 | 2552 | 2622 | 2692 | 2761 | 2824 | 2963 | 3102 |
| | .16 | \$ 2455 | 2525 | 2594 | 2657 | 2726 | 2796 | 2865 | 2935 | 3005 | 3067 | 3206 | 3345 |
| | | | | | | | | | | | | | BALANCE POINT 25 DEG.F. |
| 110,000 | | \$ 1043 | 1189 | 1342 | 1488 | 1641 | 1787 | 1940 | 2086 | 2232 | 2385 | 2685 | 2984 |
| | .05 | \$ 1154 | 1245 | 1342 | 1432 | 1523 | 1620 | 1711 | 1808 | 1899 | 1989 | 2177 | 2365 |
| | .06 | \$ 1259 | 1349 | 1446 | 1537 | 1627 | 1725 | 1815 | 1912 | 2003 | 2093 | 2281 | 2469 |
| | .07 | \$ 1356 | 1446 | 1544 | 1634 | 1725 | 1822 | 1912 | 2010 | 2100 | 2191 | 2379 | 2566 |
| | .08 | \$ 1460 | 1551 | 1648 | 1739 | 1829 | 1926 | 2017 | 2114 | 2205 | 2295 | 2483 | 2671 |
| | .09 | \$ 1558 | 1648 | 1745 | 1836 | 1926 | 2024 | 2114 | 2212 | 2302 | 2392 | 2580 | 2768 |
| | .10 | \$ 1662 | 1752 | 1850 | 1940 | 2031 | 2128 | 2219 | 2316 | 2406 | 2497 | 2685 | 2872 |
| | .12 | \$ 1864 | 1954 | 2052 | 2142 | 2232 | 2330 | 2420 | 2518 | 2608 | 2698 | 2886 | 3074 |
| | .14 | \$ 2065 | 2154 | 2253 | 2344 | 2434 | 2532 | 2622 | 2719 | 2810 | 2900 | 3088 | 3276 |
| | .16 | \$ 2267 | 2358 | 2455 | 2545 | 2636 | 2733 | 2824 | 2921 | 3012 | 3102 | 3290 | 3478 |
| | | | | | | | | | | | | | BALANCE POINT 28 DEG.F. |

REFRIGERANT COOLING CAPACITY OF HEAT PUMP IS SIZED TO MATCH COOLING LOAD.

<-ELECTRIC RATE \$/KWH
<-THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY

DUAL-FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5 60UEPQA/A61AO-A
 HEAT PUMP MODEL: OUTDOOR 60UHPOA INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70
 ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, ESSP 7.50 MIN.DHR REG IV
 BTUH (17) 35500 COP(17) 2.20
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | KILO- COST \$/KWH | HEATING OIL COST - \$/GALLON | | | | | | | | | | | | | | |
|-------------------|-------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|--|---|--|--|
| 60,000 | | .70 | .80 | .90 | 1.00 | 1.10 | 1.20 | 1.30 | 1.40 | 1.50 | 1.60 | 1.70 | 1.80 | | | |
| | \$ 820 | 939 | 1050 | 1168 | 1286 | 1405 | 1523 | 1641 | 1759 | 1878 | 1996 | 2107 | --THEORETICAL HEATING COST * FURNACE ONLY | | | |
| .05 | \$ 820 | 862 | 897 | 932 | 966 | 1001 | 1043 | 1078 | 1112 | 1147 | 1182 | 1217 | | | | |
| .06 | \$ 932 | 973 | 1008 | 1043 | 1078 | 1112 | 1154 | 1189 | 1224 | 1259 | 1293 | 1328 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1050 | 1092 | 1128 | 1161 | 1196 | 1231 | 1272 | 1307 | 1342 | 1377 | 1412 | 1446 | | | | |
| .08 | \$ 1161 | 1203 | 1238 | 1272 | 1307 | 1342 | 1384 | 1419 | 1453 | 1488 | 1523 | 1558 | | | | |
| .09 | \$ 1272 | 1314 | 1349 | 1384 | 1419 | 1453 | 1495 | 1530 | 1565 | 1599 | 1634 | 1669 | | | | |
| .10 | \$ 1391 | 1432 | 1467 | 1502 | 1537 | 1572 | 1613 | 1648 | 1683 | 1718 | 1752 | 1787 | | | | |
| .12 | \$ 1620 | 1662 | 1697 | 1732 | 1766 | 1801 | 1843 | 1878 | 1912 | 1947 | 1982 | 2017 | | | | |
| .14 | \$ 1843 | 1885 | 1919 | 1954 | 1989 | 2024 | 2065 | 2100 | 2135 | 2170 | 2205 | 2239 | BALANCE POINT 12 DEG.F. | | | |
| .16 | \$ 2072 | 2114 | 2149 | 2184 | 2219 | 2253 | 2295 | 2330 | 2365 | 2399 | 2434 | 2469 | | | | |
| 70,000 | | \$ 952 | 1092 | 1231 | 1363 | 1502 | 1641 | 1780 | 1912 | 2052 | 2191 | 2323 | 2462 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 939 | 980 | 1029 | 1071 | 1112 | 1154 | 1196 | 1238 | 1279 | 1321 | 1363 | 1405 | | | | |
| .06 | \$ 1071 | 1112 | 1161 | 1203 | 1245 | 1286 | 1328 | 1370 | 1412 | 1453 | 1495 | 1537 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1203 | 1245 | 1293 | 1335 | 1377 | 1419 | 1460 | 1502 | 1544 | 1586 | 1627 | 1669 | | | | |
| .08 | \$ 1328 | 1370 | 1419 | 1460 | 1502 | 1544 | 1586 | 1627 | 1669 | 1711 | 1752 | 1794 | | | | |
| .09 | \$ 1460 | 1502 | 1551 | 1592 | 1634 | 1676 | 1718 | 1759 | 1801 | 1843 | 1885 | 1926 | | | | |
| .10 | \$ 1592 | 1634 | 1683 | 1725 | 1766 | 1808 | 1850 | 1892 | 1933 | 1975 | 2017 | 2059 | | | | |
| .12 | \$ 1850 | 1892 | 1940 | 1982 | 2024 | 2065 | 2107 | 2149 | 2191 | 2232 | 2274 | 2316 | | | | |
| .14 | \$ 2114 | 2156 | 2205 | 2246 | 2288 | 2330 | 2372 | 2413 | 2455 | 2497 | 2538 | 2580 | BALANCE POINT 16 DEG.F. | | | |
| .16 | \$ 2372 | 2413 | 2462 | 2504 | 2545 | 2587 | 2629 | 2671 | 2712 | 2754 | 2796 | 2838 | | | | |
| 80,000 | | \$ 1092 | 1252 | 1405 | 1565 | 1718 | 1878 | 2031 | 2191 | 2344 | 2504 | 2657 | 2817 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1057 | 1119 | 1182 | 1245 | 1307 | 1370 | 1432 | 1495 | 1558 | 1620 | 1683 | 1745 | | | | |
| .06 | \$ 1182 | 1245 | 1307 | 1370 | 1432 | 1495 | 1558 | 1620 | 1683 | 1745 | 1808 | 1871 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1314 | 1377 | 1439 | 1502 | 1565 | 1627 | 1690 | 1752 | 1815 | 1878 | 1940 | 2003 | | | | |
| .08 | \$ 1439 | 1502 | 1565 | 1627 | 1690 | 1752 | 1815 | 1878 | 1940 | 2003 | 2065 | 2128 | | | | |
| .09 | \$ 1565 | 1627 | 1690 | 1752 | 1815 | 1878 | 1940 | 2003 | 2065 | 2128 | 2191 | 2253 | | | | |
| .10 | \$ 1690 | 1752 | 1815 | 1878 | 1940 | 2003 | 2065 | 2128 | 2191 | 2253 | 2316 | 2379 | | | | |
| .12 | \$ 1940 | 2003 | 2065 | 2128 | 2191 | 2253 | 2316 | 2379 | 2441 | 2504 | 2566 | 2629 | | | | |
| .14 | \$ 2191 | 2253 | 2316 | 2379 | 2441 | 2504 | 2566 | 2629 | 2692 | 2754 | 2817 | 2879 | BALANCE POINT 19 DEG.F. | | | |
| .16 | \$ 2441 | 2504 | 2566 | 2629 | 2692 | 2754 | 2817 | 2879 | 2942 | 3005 | 3067 | 3130 | | | | |
| 90,000 | | \$ 1231 | 1405 | 1579 | 1759 | 1933 | 2107 | 2288 | 2462 | 2636 | 2817 | 2991 | 3165 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1182 | 1272 | 1363 | 1453 | 1537 | 1627 | 1718 | 1808 | 1892 | 1982 | 2072 | 2163 | | | | |
| .06 | \$ 1300 | 1391 | 1481 | 1572 | 1655 | 1745 | 1836 | 1926 | 2010 | 2100 | 2191 | 2281 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1412 | 1502 | 1592 | 1683 | 1766 | 1857 | 1941 | 2038 | 2121 | 2212 | 2302 | 2392 | | | | |
| .08 | \$ 1523 | 1613 | 1704 | 1794 | 1878 | 1968 | 2059 | 2149 | 2232 | 2323 | 2413 | 2504 | | | | |
| .09 | \$ 1643 | 1725 | 1815 | 1905 | 1989 | 2079 | 2170 | 2260 | 2344 | 2434 | 2525 | 2615 | | | | |
| .10 | \$ 1752 | 1843 | 1933 | 2024 | 2107 | 2198 | 2288 | 2379 | 2462 | 2552 | 2643 | 2733 | | | | |
| .12 | \$ 1975 | 2065 | 2156 | 2246 | 2330 | 2420 | 2511 | 2601 | 2685 | 2775 | 2865 | 2956 | | | | |
| .14 | \$ 2205 | 2295 | 2385 | 2476 | 2559 | 2650 | 2740 | 2831 | 2914 | 3005 | 3095 | 3185 | BALANCE POINT 23 DEG.F. | | | |
| .16 | \$ 2427 | 2518 | 2608 | 2698 | 2782 | 2872 | 2963 | 3053 | 3137 | 3227 | 3318 | 3408 | | | | |
| 100,000 | | \$ 1363 | 1565 | 1759 | 1954 | 2149 | 2344 | 2538 | 2733 | 2935 | 3130 | 3325 | 3519 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1307 | 1405 | 1509 | 1606 | 1704 | 1801 | 1899 | 2003 | 2100 | 2198 | 2295 | 2392 | | | | |
| .06 | \$ 1432 | 1530 | 1634 | 1732 | 1829 | 1926 | 2024 | 2128 | 2225 | 2323 | 2420 | 2518 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1551 | 1648 | 1752 | 1850 | 1947 | 2045 | 2142 | 2246 | 2344 | 2441 | 2538 | 2636 | | | | |
| .08 | \$ 1676 | 1773 | 1878 | 1975 | 2072 | 2170 | 2267 | 2372 | 2469 | 2566 | 2664 | 2761 | | | | |
| .09 | \$ 1801 | 1899 | 2003 | 2100 | 2198 | 2295 | 2392 | 2497 | 2594 | 2692 | 2789 | 2886 | | | | |
| .10 | \$ 1926 | 2024 | 2128 | 2225 | 2323 | 2420 | 2518 | 2622 | 2719 | 2817 | 2914 | 3012 | | | | |
| .12 | \$ 2170 | 2267 | 2372 | 2469 | 2566 | 2664 | 2761 | 2865 | 2963 | 3060 | 3158 | 3255 | | | | |
| .14 | \$ 2420 | 2518 | 2622 | 2719 | 2817 | 2914 | 3012 | 3116 | 3213 | 3311 | 3408 | 3505 | BALANCE POINT 25 DEG.F. | | | |
| .16 | \$ 2664 | 2761 | 2865 | 2963 | 3060 | 3158 | 3255 | 3359 | 3457 | 3554 | 3651 | 3749 | | | | |
| 110,000 | | \$ 1502 | 1718 | 1933 | 2149 | 2365 | 2580 | 2796 | 3012 | 3227 | 3443 | 3658 | 3874 | --THEORETICAL HEATING COST * FURNACE ONLY | | |
| .05 | \$ 1439 | 1579 | 1711 | 1843 | 1982 | 2114 | 2246 | 2385 | 2518 | 2650 | 2789 | 2921 | | | | |
| .06 | \$ 1544 | 1683 | 1815 | 1947 | 2086 | 2219 | 2351 | 2490 | 2622 | 2754 | 2893 | 3025 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR | | | |
| .07 | \$ 1641 | 1780 | 1912 | 2045 | 2184 | 2316 | 2448 | 2587 | 2719 | 2852 | 2991 | 3123 | | | | |
| .08 | \$ 1745 | 1885 | 2017 | 2149 | 2288 | 2420 | 2552 | 2694 | 2824 | 2956 | 3095 | 3227 | | | | |
| .09 | \$ 1843 | 1982 | 2124 | 2246 | 2385 | 2518 | 2650 | 2789 | 2921 | 3053 | 3192 | 3325 | | | | |
| .10 | \$ 1947 | 2086 | 2219 | 2351 | 2490 | 2622 | 2754 | 2893 | 3025 | 3158 | 3297 | 3429 | | | | |
| .12 | \$ 2149 | 2288 | 2420 | 2552 | 2692 | 2824 | 2956 | 3095 | 3227 | 3359 | 3498 | 3631 | | | | |
| .14 | \$ 2351 | 2490 | 2622 | 2754 | 2893 | 3025 | 3158 | 3297 | 3429 | 3561 | 3700 | 3832 | BALANCE POINT 28 DEG.F. | | | |
| .16 | \$ 2552 | 2692 | 2824 | 2956 | 3095 | 3227 | 3359 | 3498 | 3631 | 3763 | 3902 | 4034 | | | | |

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

<--ELECTRIC RATE \$/KWH
<--THEORETICAL AIR CONDITIONING COST

1990-1991

BARD MANUFACTURING COMPANY

DUAL-FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 5
 HEAT PUMP MODEL: OUTDOOR 60UHP0A INDOOR A61AO-A
 ARI RATED COOLING CAP.: BTUH(95) 58000 SEER10.70
 ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, ESEPF 7.50 MIN.DER REG IV
 BTUH (17) 35500, COP(17) 2.20
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

| HEAT LOSS BTUH | ELEC. COST \$/KWH | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.10 | 1.20 | 1.30 | PROPANE GAS COST - \$/GALLON |
|----------------------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------------------------------------|
|----------------------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------------------------------------|

| | | |
|---------|--|---|
| 60,000 | \$ 1071 1161 1252 1335 1426 1516 1606 1697 1787 1968 2142 2142 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 897 925 952 980 1008 1036 1064 1092 1119 1147 1175 1203 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ 1008 1036 1064 1092 1119 1147 1175 1203 1231 1259 1286 1342 | S PER YEAR |
| .07 | \$ 1126 1154 1182 1210 1238 1266 1293 1321 1349 1405 1460 1460 | |
| .08 | \$ 1238 1266 1293 1321 1349 1377 1405 1432 1460 1516 1572 1572 | |
| .09 | \$ 1349 1377 1405 1432 1460 1488 1516 1544 1572 1627 1683 1683 | |
| .10 | \$ 1467 1495 1523 1551 1579 1606 1634 1662 1690 1745 1801 1801 | |
| .12 | \$ 1697 1725 1752 1780 1808 1836 1864 1892 1919 1975 2031 2031 | |
| .14 | \$ 1919 1947 1975 2003 2031 2059 2086 2114 2142 2198 2253 2253 | |
| .16 | \$ 2149 2177 2205 2232 2260 2288 2316 2344 2372 2427 2483 2483 | BALANCE POINT 12 DEG.F. |
| 70,000 | \$ 1252 1356 1460 1565 1669 1773 1878 1982 2086 2295 2504 2504 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1029 1064 1099 1126 1161 1189 1224 1259 1286 1356 1419 1419 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ 1161 1196 1231 1259 1293 1321 1356 1391 1419 1488 1551 1551 | S PER YEAR |
| .07 | \$ 1293 1328 1363 1391 1426 1453 1488 1523 1551 1620 1683 1683 | |
| .08 | \$ 1419 1453 1488 1516 1551 1579 1613 1648 1676 1745 1808 1808 | |
| .09 | \$ 1551 1586 1620 1648 1683 1711 1745 1780 1808 1878 1940 1940 | |
| .10 | \$ 1683 1718 1752 1780 1815 1843 1878 1912 1940 2010 2072 2072 | |
| .12 | \$ 1940 1975 2010 2038 2072 2100 2135 2170 2198 2267 2330 2330 | |
| .14 | \$ 2205 2239 2274 2302 2337 2365 2399 2434 2462 2532 2594 2594 | |
| .16 | \$ 2462 2497 2532 2559 2594 2622 2657 2692 2719 2789 2852 2852 | BALANCE POINT 16 DEG.F. |
| 80,000 | \$ 1426 1551 1669 1787 1905 2024 2142 2260 2385 2622 2858 2858 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1196 1238 1286 1335 1384 1432 1474 1523 1572 1669 1759 1759 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ 1321 1363 1412 1460 1509 1558 1599 1648 1697 1794 1885 1885 | S PER YEAR |
| .07 | \$ 1453 1495 1544 1592 1641 1690 1730 1780 1829 1926 2017 2017 | |
| .08 | \$ 1579 1620 1669 1718 1766 1815 1857 1905 1954 2052 2142 2142 | |
| .09 | \$ 1704 1745 1794 1843 1892 1940 1982 2031 2079 2177 2267 2267 | |
| .10 | \$ 1829 1871 1919 1968 2017 2065 2107 2156 2205 2302 2392 2392 | |
| .12 | \$ 2079 2121 2170 2219 2267 2316 2358 2406 2455 2552 2643 2643 | |
| .14 | \$ 2330 2372 2420 2469 2518 2566 2608 2657 2705 2803 2893 2893 | |
| .16 | \$ 2580 2622 2671 2719 2768 2817 2858 2907 2956 3053 3144 3144 | BALANCE POINT 19 DEG.F. |
| 90,000 | \$ 1606 1739 1878 2010 2142 2281 2413 2545 2678 2949 3220 3220 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1377 1439 1509 1579 1648 1711 1780 1850 1919 2052 2184 2184 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ 1495 1558 1627 1697 1766 1829 1899 1968 2038 2170 2302 2302 | S PER YEAR |
| .07 | \$ 1606 1669 1739 1808 1878 1940 2010 2079 2149 2281 2413 2413 | |
| .08 | \$ 1718 1780 1850 1919 1989 2052 2121 2191 2260 2392 2525 2525 | |
| .09 | \$ 1829 1892 1961 2031 2100 2163 2232 2302 2372 2504 2636 2636 | |
| .10 | \$ 1947 2010 2079 2149 2219 2281 2351 2420 2490 2622 2754 2754 | |
| .12 | \$ 2170 2232 2302 2372 2441 2504 2573 2643 2712 2845 2977 2977 | |
| .14 | \$ 2399 2462 2532 2601 2671 2733 2803 2872 2942 3074 3206 3206 | |
| .16 | \$ 2622 2685 2754 2824 2893 2956 3025 3095 3165 3297 3429 3429 | BALANCE POINT 23 DEG.F. |
| 100,000 | \$ 1787 1933 2086 2232 2385 2532 2678 2831 2977 3276 3575 3575 | --THEORETICAL HEATING COST * FURNACE ONLY |
| .05 | \$ 1523 1592 1669 1745 1822 1899 1975 2045 2121 2274 2420 2420 | THEORETICAL HEATING COST * FURN.+ HEAT PUMP |
| .06 | \$ 1648 1718 1794 1871 1947 2024 2100 2170 2246 2399 2545 2545 | S PER YEAR |
| .07 | \$ 1766 1836 1912 1989 2065 2142 2219 2288 2365 2518 2664 2664 | |
| .08 | \$ 1892 1961 2038 2114 2191 2267 2344 2413 2490 2643 2789 2789 | |
| .09 | \$ 2017 2084 2163 2239 2316 2392 2469 2538 2615 2768 2914 2914 | |
| .10 | \$ 2142 2212 2288 2365 2441 2518 2594 2664 2740 2893 3039 3039 | |
| .12 | \$ 2385 2455 2532 2608 2685 2761 2838 2907 2984 3137 3283 3283 | |
| .14 | \$ 2636 2705 2782 2858 2935 3012 3089 3158 3234 3387 3533 3533 | |
| .16 | \$ 2899 2949 3025 3102 3178 3255 3332 3401 3478 3631 3777 3777 | BALANCE POINT 25 DEG.F. |

16 \$ 2845 2942 3048 3151 3255 3352 3451 3551 3651 3751 3851 3951

DESIRED COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON LOCAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

105 106 107 108 109 110 112 114 116
129 130 151 173 195 216 260 303 346

<-ELECTRIC RATE \$/KWH
<-THEORETICAL AIR CONDITIONING COST